Central University of Haryana
Re-Appear VI Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 608A **Max Time: 3Hrs**
Course Title: Colour Essentials **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Write a short note on the following:

(a) HSV colour model.

(b) Metamerism

(c) UCR

(d) Concept of 2-degree standard observer

(e) Gray balance

(f) Colour Density

(g) Retouching.

PART –II

Q. No.2 Write down the process of colour reproduction from original to colour printing.

OR

Q. No.2 Write a note on RGB, HSV and ICC colour models used in colour management.

Q. No.3 Write a note on CIE colour standard and tri-stimulus values.

OR

Q. No 3 Write a note on originals and transparencies, its types. Mention qualities of good original.

Q. No.4 Discuss working of spectrophotometer used in colour management.

OR

Q. No .4 Explain the factors which influences colour printing and discuss colour control strips.

Q. No.5 Discuss about the principle of electronic scanning.

OR

Q. No.5 What is screening. Discuss about different types of screening methods along with the advantages and disadvantages.

CENTRAL UNIVERSITY OF HARYANA

Term End Examinations January 2023 (Reappear)

Programme: B. Tech (Printing and Packaging Technology **Session: 2022-23**

Semester: VI **Max. Time: 3 Hours**

Course Title: Course - Positive Psychology **Max. Marks: 70**

Course Code: BT PPT 607A

Instructions:

1. Question no. 1 has seven parts and students are required to answer any four. Each part carries three and half Marks.
2. Question no. 2 to 5 have three parts and student are required to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) What is VIA classification?

b) Explain flourishing.

c) What is life satisfaction?

d) Discuss the goals of Psychology.

e) Explain the concept of altruism.

f) What do you understand by self-efficacy?.

g) Discuss the concept of flow.

Q 2. (2X7=14)

a) Discuss the Eastern Perspectives on Positive Psychology.

b) Explain Character Strengths.

c) How did Positive Psychology emerge?

Q3. (2X7=14)

a) What does Broaden and Build theory explain?

b) What is happiness? How can it be enhanced?

c) What influence does Positive Emotions have on Physical, Social and Psychological health of an Individual?

Q 4. (2X7=14)

a) What do you understand by the concept of Wisdom?

b) State the difference between Hope and Optimism.

c) How does Mindfulness effect Well Being?

Q 5. (2X7=14)

a) Elucidate upon the characteristics of Close Relationships.

b) Express the importance of Gratitude.

c) What is forgiveness? How does it contribute to mental health?

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 508A **Max Time: 3Hrs**
Course Title: Flexible Packaging **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Write short note on the following:

(a) Thermoplastics.

(b) Applications of PVC

(c) Injection moulding

(d) Closures

(e) Printing on lamitubes

(f) Aseptic technology

(g) Bag-in-Box

PART –II

Q. No.2 Write a detailed note on additives used in plastics.

OR

Q. No.2 Write a note on polymers, its classification and types of polymerization process.

Q. No.3 Write about the process of blown film extrusion process.

OR

Q. No 3 Discuss about sealing techniques and different types of sealers.

Q. No.4 Write a note on structure of lamitubes and layers in laminate.

OR

Q. No .4 Write a note on Tetra pack. Discuss the sterilization processes.

Q. No.5 Write a note on materials used for making.

OR

Q. No.5 Discuss about the films used for shrink and stretch wrapping.

Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT302A — Max Time: 03 Hours
Course Title: Basics of Packaging Technology — Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1. Write a short note on the following: -

(a) Packaging

(b) Shelf life

(c) Surface design

(d) Advantages of wood-based packaging

(e) Applications of jute-based packaging

(f) Flexible laminates

(g) Limitations of metal-based packaging

PART –II

Q. No.2. (a) Write about the history of packaging. (04 Marks)

(b) Explain the types and functions of packaging in detail. (10 marks)

OR

Q. No.2. Explain the mechanical, chemical, and biological protective functions of packaging in detail. (14 marks)

Q. No.3. Explain the factors that influence design in detail. (14 marks)

OR

Q. No 3. Write about consumer research in the packaging field and the importance of consideration of design and marketing in detail. (14 marks)

Q. No.4. Write in detail the applications, advantages, and limitations of paper-based packaging. (14 marks)

OR

Q. No .4. Write in detail the applications, advantages, and limitations of plastic-based packaging. (14 marks)

Q. No.5. Explain the characteristics and uses performance requirements of the paper and board packaging material. (14 marks)

OR

Q. No.5. Write about the flexible packaging materials in detail. (14 marks)

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 304A — **Max Time: 3Hrs**
Course Title: Electronic Composition — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Write a short note on the following:

(a) Qualities of a good copy.

(b) Scanners.

(c) Principle of Image setter.

(d) Adobe Distiller

(e) Standard program features of Adobe PageMaker

(f) Vector graphic creation.

(g) Bitmap graphic creation.

PART –II

Q. No.2 Write a note on OCR stating its working principle. Discuss about the factors that affects the performance of OCR.

OR

Q. No.2 What is proofing? Write any 10 proof reading marks.

Q. No.3 Write a note on CtP. Discuss about various plate processing steps in CtP.

OR

Q. No 3 Write a note on PostScript Language. Write about the structure of a PS file.

Q. No.4 Write a note on Desktop Publishing.

OR

Q. No .4 Discuss about various image editing commands.

Q. No.5 Write a detailed note on digital fonts.

OR

Q. No.5 Discuss about the future trends and developments in electronic composition.

Central University of Haryana
Term End Examinations January 2023
B.Tech. Programmes
Branch: Printing and Packaging Tech.

Course Code:BT PPT 613A — **Max Time: 03Hours**
Course Title: Smart Packaging — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define smart packaging.

(b) What do you mean by Scavengers?

(c) Define RFID.

(d) What do you mean by antimicrobial packaging?

(e) Describe enzyme release packaging.

(f)What do you mean by beverage packaging?

(g) What is tamper-proof packaging?

PART –II

Q. No.2 Give brief introduction about smart packaging also explain types of scavengers,

OR

Q. No.2 what is the role of absorbers and releasers in smart packaging.

Q. No.3 Discuss in detail about antimicrobial packaging system for food packaging.

OR

Q. No 3 Describe the design of antimicrobial packaging system and its future.

Q. No.4 Give brief introduction about RFID and its applications in smart packaging.

OR

Q. No .4 Describe the procedure for testing RFID also explain its characteristics.

Q. No.5 Discuss in detail about smart packaging for beverage products also explain types of beverage packaging.

OR

Q. No.5 Explain thermo-chromic labelling and its applications in smart packaging.

Central University of Haryana
V/VII Semester Term End Examination January 2023
B.Tech. Programmes

Branch:

Course Code: **BT PPT 505 A** **Max Time: 3 HOURS**
Course Title: Flexo, Gravure & Screen Printing **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define flexographic printing principle.

(b) Which material is used for manufacturing of doctor blade?

(c) How many types of cell structure can be designed on anilox roller?

(d) What are the key factors we have to keep in mind for selection of squeegee for screen printing?

(e) How can you reuse gravure cylinder?

(f) Write advantages and applications of gravure printing process.

(g) What do you understand by term Balancing of cylinder? How many types we can balance gravure cylinder?

PART –II

Q. No.2 Describe different methods of gravure cylinder preparation.

OR

Q. No.2 Classify different processes used to prepare photo stencil.

Q. No.3 Write down the steps used for manufacturing of rubber plate for flexographic Printing.

OR

Q. No 3 What is function of doctor blade? Write down all types of doctor blade design used in Gravure printing.

Q. No.4. Give a detailed view on preparation of photopolymer plate (sheet & liquid plate).

OR

Q. No .4 Write down in detail about different types of screen-printing machine.

Q. No.5.How many types of well design produce in diffusion etch technique.

OR

Q. No.5. Explain electrostatic assist impression system. Describe copper plating and polishing method of gravure cylinder.

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Tech.

Course Code: BT PPT 301A **Max Time: 03 Hours**
Course Title: Basics of Printing Technology **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define Printing.
(b) Describe Gravure Printing Process.
(c) What do you mean by pre-make ready operations?
(d) Write any two Advantages of Flexographic Printing Process.
(e) What is Digital Printing?
(f) State any two Advantages of Screen Printing.
(g)Describe any two Printing Defects of Offset Process.

PART –II

Q. No.2 Describe basic Principle, characteristics, applications and advantages of Gravure Printing Process.

OR

Q. No.2 Discuss in detail about history of printing and evolution of various printing processes.

Q. No.3 Define Letterpress Printing Process. Explain the classification of Letterpress Printing machines with suitable diagram.

OR

Q. No 3 Give brief introduction of offset Printing Process also explain different units of offset machine.

Q. No.4 Explain the principle of flexographic printing process with its characteristics also describe the components of flexo press.

OR

Q. No .4 Give brief introduction of image carrier preparation for gravure printing also explain inks used for gravure process.

Q. No.5 Explain the direct and indirect photo stencil preparation for Screen Printing Process with suitable diagram.

OR

Q. No.5 Describe various tools and equipments used for screen printing process with suitable diagram. Also explain the application of screen printing.

Central University of Haryana
Sixth Semester (Re-appear) January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code:BT PPT 603A
Course Title: Print Finishing and Converting

Max Time: 03Hours
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Describe the term Print Finishing.

(b) What do you mean by binding materials?

(c) Define End paper.

(d) Names different parts of paper cutting machine.

(e) Describe the principle of Folding.

(f)What do you mean by Securing operation?

(g)Define Adhesive binding.

PART –II

Q. No.2 Discuss in details about Binding materials used in Print finishing and binding operations.

OR

Q. No.2 Explain various kind of binding and finishing tools used in print finishing process, with suitable diagram.

Q. No.3 Describe Guillotines cutting machine, its working and various parts with suitable diagram.

OR

Q. No 3 Explain the operational procedure of sensors and hydraulic system used in cutting machine.

Q. No.4 Describe Folding scheme also explain various types of folding for sheet and web.

OR

Q. No .4 Discuss in details about mechanism, operation and adjustment of folding machine.

Q. No.5 Explain the working procedure of wire stitching machine and its parts with diagram.

OR

Q. No.5 Discuss in details about gathering operation with feeders, delivery and inline production.

Central University of Haryana
Odd Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing & Packaging Technology
Course Code: BT ECO507A
Course Title: Economics

Max Time: 3 Hrs
Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 (2*7 = 14)

a) Define Circular flow of economic activities?
b) Define the term Utility?
c) What is Indifference Curve?
d)
e) Define the term Demand?
f) Write an example of Sunk cost?
g) Mention the names of various market structures?
h) Write down the objectives of World Bank?

PART –II

Q. No.2 Differentiate between Cardinal Utility and Ordinal Utility and explain the law of Diminishing Marginal Utility with suitable examples and graphs? (14 marks)

OR

Q. No.2 Describe, in brief the importance of Production Possibility Curve and also explains the factors that can shift the Production Possibility Curve? (14 marks)

Q. No.3 Differentiate between elastic and inelastic demand with suitable examples and also explain four determinants of demand with suitable examples? (14 marks)

OR

Q. No 3 Differentiate between the Indifference curve and Indifference map and explain all the properties of indifference curve with suitable graphs and figures? (14 marks)

Q. No.4 Differentiate between average cost and marginal cost with suitable examples and explain the Law of returns to scale using an appropriate graph? (14 marks)

OR

Q. No .4 Describe, in brief the factors of production and explain the Law of variable proportions with suitable graphs? (14 marks)

Q. No.5 Differentiate between economic and non-economic activities with suitable examples and explain problems encountered in calculating national income? (14 marks)

OR

Q. No.5 Describe Privatization, its merits and demerits and also describe the characteristics of Oligopoly and Monopolistic market structures with suitable examples? (14 marks)

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 503A — **Max Time: 3 Hours**
Course Title: Packaging Process-II — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 **Write short notes on following:**

(a) Corrugated Board
(b) Seamless Cans
(c) Glass container
(d) Metals used in making metal containers
(e) Foam-in-place
(f) Galvanized steel
(g) Dimensions of box

PART –II

Q. No.2 Discuss various board box styles used in packaging segments.

OR

Q. No.2 Explain components and types of corrugated board and its applications.

Q. No.3 Explain raw materials used in manufacturing glass containers and disadvantages of glass containers.

OR

Q. No 3 Explain different types of glass containers with their applications in packaging industry.

Q. No.4 What do you mean by cushioning materials? Discuss need of cushioning materials in packaging.

OR

Q. No .4 Explain various forms of cushioning materials used in packaging.

Q. No.5 What do you mean by metal cans? Explain types of metal cans and their uses in packaging segments.

OR

Q. No.5 Write note on followings:

a) Collapsible Tubes

b) Aerosol containers

Central University of Haryana
VI Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 601A — **Max Time: 3 Hours**
Course Title: Digital and Security Printing — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 **Write on followings:**

(a) Digital printing

(b) Trapping

(c) Thermal plates

(d) Holographic foil

(e) Watermark

(f) Plate-setter

(g) MICR cheque

PART –II

Q. No.2 Explain various file formats used in digital printing process.

OR

Q. No.2 Explain various digital proofing techniques used in printing house.

Q. No.3 What is digital imaging? Explain any one technique for the preparation of offset plate.

OR

Q. No 3 What do you mean by RIP? Explain various components of RIP with their functions.

Q. No.4 Discuss various security documents with their security features.

OR

Q. No .4 Explain different types of security inks and their applications.

Q. No.5 Discuss various printing processes used in security printing house.

OR

Q. No.5 Explain innovative developments and trends in security printing segment.

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 501 A — Max Time: 03 Hrs
Course Title: Printing Image Generation — Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers **2(two) to 5(five)- Part II** carry fourteen marks each with internal choice.

PART -I

Q. No.1 Briefly explain the following:

a) Contact Film
b) Surface Plates for Offset Printing
c) Types of Gravure Cylinders
d) Limitations of rubber plates used in Flexography Printing
e) Base materials for Photopolymer Plates
f) Dry Offset
g) Image Carrier for Screen Printing

PART –II

Q. No.2 Explain different types of films and proofing materials used for printing image generation.

OR

Q. No.2 Describe basic steps in planning a film image assembly for single color printing and multi color printing.

Q. No.3 Explain in detail image generation of positive and negative working plates.

OR

Q. No 3 Explain various methods of Gravure Image Cylinder preparation.

Q. No.4 Explain in detail plate making process of Flexo Rubber Plates and Flexo Photopolymer Plates with neat diagrams.

OR

Q. No.4 Explain CTP technology in detail with its types.

Q. No.5 Describe importance of Quality Control in Image Carrier Preparation department. Mention Quality Control Aids, tools and equipments used for the same.

OR

Q. No.5 Explain preparation of image carrier for Dry-offset.

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 512A **Max Time: 3Hrs**
Course Title: Packaging Techniques & Processes **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Write a short note on the following:

(a) Co-extrusion.

(b) Dry lamination.

(c) Requirement for retort packaging

(d) Bag-in-Box packaging technique

(e) Shrink wrapping

(f) Stretch wrapping

(g) System packaging

PART –II

Q. No.2 Write a detailed note on the extrusion process and its advantages and disadvantages.

OR

Q. No.2 Write a note on different lamination techniques.

Q. No.3 Write a detail note about aseptic packaging technology.

OR

Q. No 3 Write about the processing and advantages of lamitubes.

Q. No.4 Write a note on closures. Discuss about various types of closures.

OR

Q. No .4 Discuss about different types of flexible pouches.

Q. No.5 Discuss in detail about aerosols.

OR

Q. No.5 Discuss in detail about strip and blister packaging.

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch:Printing and Packaging Tech.

Course Code:BT PPT 605A **Max Time: 03Hours**

Course Title:Speciality Printing, Marketing and Legislations in Packaging

Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define embossing.
(b) What do you mean by graphic design?
(c) Define demand forecasting.
(d) What do you mean by market research?
(e) Describe Export marketing.
(f)What do you mean by PFA?
(g)Define legislation in packaging.

PART –II

Q. No.2 Describe Specialty Printing and explain various processes comes under specialty printing.

OR

Q. No.2 What do you mean by Graphic Design also explain white ink printing and RFID.

Q. No.3 Give brief introduction about marketing management with market structure and model.

OR

Q. No 3 What is the role of demand forecasting in relation to the marketing management discuss in detail?

Q. No.4 Discuss in detail about impact of package design on marketing of a product.

OR

Q. No .4 Explain how better packaging is an instrument of marketing.

Q. No.5 Discuss in detail about legislations in packaging and their requirements in packaging.

OR

Q. No.5 what do you mean by FPO? Explain the rules and regulations of FPO.

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 307A — **Max Time: 03 Hours**
Course Title: Basics of Printing and Packaging Technology — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1. Write a short note on the following

(a) Applications of the letterpress printing process

(b) Fountain Roll

(c) Screen Printing

(d) Packaging

(e) Primary packaging

(f) Blister packaging

(g) Shrink packaging

PART –II

Q. No.2. Explain types of flexography press in detail.

OR

Q. No.2. Write about the classification of letterpress printing machines in detail.

Q. No.3. Write about the gravure printing process and explain the different units of gravure printing machine.

OR

Q. No 3. Define the digital printing process and explain the application, advantages & disadvantages of the digital printing process.

Q. No.4. Explain the functions & roles of packaging in detail.

OR

Q. No .4. Write about flexible, rigid, and semi-rigid packages in detail.

Q. No.5. Explain the components of corrugated board, flutes, and stages in the preparation of corrugated board.

OR

Q. No.5. Write the production steps of folding cartons and their types.

Central University of Haryana
3rd Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 304A **Max Time: 3Hrs**
Course Title: Electronic Composition **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Write a short note on the following:
(a) Qualities of a good copy.
(b) Scanners.
(c) Principle of Imagesetter.
(d) Adobe Distiller
(e) Standard program features of Adobe Pagemaker
(f) Vector graphic creation.
(g) Bitmap graphic creation.

PART –II

Q. No.2 Write a note on OCR stating its working principle. Discuss about the factors that affects the performance of OCR.
OR
Q. No.2 What is proofing? Write any 10 proof reading marks.

Q. No.3 Write a note on CtP. Discuss about various plate processing steps in CtP.
OR
Q. No 3 Write a note on PostScript Language. Write about the structure of a PS file.

Q. No.4 Write a note on Desktop Publishing.
OR
Q. No .4 Discuss about various image editing commands.

Q. No.5 Write a detailed note on digital fonts.
OR
Q. No.5 Discuss about the future trends and developments in electronic composition.

Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 306A **Max Time: 3 Hours**
Course Title: Printing & Packaging Materials Science-I **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 **Write on followings:**

(a) Photopolymer

(b) Vulcanization of rubber

(c) Al Foil

(d) Pulping

(e) GSM

(f) Wettability

(g) Chemical Graining

PART –II

Q. No.2 What do you understand by polymer? Explain various types of polymers used in printing and packaging industries.
OR
Q. No.2 Discuss various ingredients of printing and packaging ink.

Q. No.3 What do you mean by colloid? Explain also various properties of colloids.
OR
Q. No 3 Discuss uses of colloids in printing and packaging industries.

Q. No.4 Explain fibrous and non-fibrous materials used in manufacturing paper.
OR
Q. No .4 Discuss various sections of a paper manufacturing machine.

Q. No.5Discuss various metals with their properties and uses used in printing and packaging houses.
OR
Q. No.5 Write note on followings:

a) Electroplating

b) Galvanizing

Central University of Haryana
III/V Semester Term End Examination Jan. 2023
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 307A **Max Time: 03 Hours**
Course Title: Basics of Printing and Packaging Technology **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1.

(a) Define Letterpress Printing Process.
(b) What is the function of Anilox roller?
(c) Define Strip Packaging.
(d)What do you mean by Make ready operation?
(e) Define Primary packaging.
(f) Write any two advantages of Screen Printing.
(g) Define Vacuum Packaging.

PART –II

Q. No.2. Give the basic introduction of Letterpress Printing Process also describe its advantages, disadvantages and applications.

OR

Q. No.2. Discuss in detail about Flexography Printing Process also explain types of Flexography press with suitable diagram.

Q. No.3. Explain the principle of Gravure Printing Process also describe the basic components of Gravure printing machine with diagram.

OR

Q. No 3. Define the digital printing process and explain the application, advantages & disadvantages of the digital printing process.

Q. No.4. Describe the factors influencing design of a package also explain functions and roles of packaging.

OR

Q. No .4. Discuss in detail about flexible, rigid, and semi-rigid package also describe handling marks on package.

Q. No.5. What do you mean by corrugated board, explain its components and stages of preparation of corrugated board?

OR

Q. No.5. Discuss in detail about Innovative Packaging also explain Shrink, Stretch and Blister packaging.

Central University of Haryana
3rd Semester Term End Examination Jan. 2023
B.Tech. Programmes
Branch: Printing and Packaging Tech.

Course Code: BT PPT 301A **Max Time: 03 Hours**
Course Title: Basics of Printing Technology **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define Printing.
(b) Describe Gravure Printing Process.
(c) What do you mean by pre-make ready operations?
(d) Write any two Advantages of Flexographic Printing Process.
(e) What is Digital Printing?
(f) State any two Advantages of Screen Printing.
(g)Describe any two Printing Defects of Offset Process.

PART –II

Q. No.2 Describe basic Principle, characteristics, applications and advantages of Gravure Printing Process.

OR

Q. No.2 Discuss in detail about history of printing and evolution of various printing processes.

Q. No.3 Define Letterpress Printing Process. Explain the classification of Letterpress Printing machines with suitable diagram.

OR

Q. No 3 Give brief introduction of offset Printing Process also explain different units of offset machine.

Q. No.4 Explain the principle of flexographic printing process with its characteristics also describe the components of flexo press.

OR

Q. No .4 Give brief introduction of image carrier preparation for gravure printing also explain inks used for gravure process.

Q. No.5 Explain the direct and indirect photo stencil preparation for Screen Printing Process with suitable diagram.

OR

Q. No.5 Describe various tools and equipments used for screen printing process with suitable diagram. Also explain the application of screen printing.

Central University of Haryana
Re-Appear VI Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 615A — Max Time: 03 Hours
Course Title: 3D Printing — Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1. Write a short note on the following

(a) 3DPrinting

(b) Overhangs

(c) PLA and its advantages

(d) Graphene and its advantages

(e) Positioning system of inkjet technology

(f) Color Jet

(g) Use of 3D printing in healthcare

PART –II

Q. No.2. Explain the model preparation and slicing method of 3D printing in detail.

OR

Q. No.2. Write in detail about file formats used in 3D printing.

Q. No.3. Explain the FDM process with advantages and limitations in detail.

OR

Q. No 3. Explain the Vat polymerization process with advantages and limitations in detail.

Q. No.4. Write about print head considerations and the continuous-type inkjet printing process.

OR

Q. No .4. Discuss the drop-on-demand inkjet printing process in detail.

Q. No.5. Explain future trends of 3D printing in detail.

OR

Q. No.5. write applications of 3D printing in food with its advantages?

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 708A **Max Time: 3Hrs**
Course Title: Hybrid Printing Technology **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Write a short note on the following:

(a) Principal of Offset Printing.
(b) Hybrid Printing
(c) Electrophotography.
(d) Inkjet Printing
(e) Example of DI with NIP
(f) CTP
(g) Advantages of Hybrid System.

PART –II

Q. No.2 Discuss about the advantages and disadvantages of Offset and flexography printing Processes.

OR

Q. No.2 Write any five unique features of different conventional printing technologies.

Q. No.3 Discuss in detail about hybrid printing system combining conventional Printing Technologies.

OR

Q. No 3 Write a note on hybrid printing system combining NIP Technologies.

Q. No.4 Write a note on Hybrid Printing Systems combining Conventional and NIP Technologies.

OR

Q. No .4 Discuss about Hybrid printing systems combining computer to press with NIP Technologies.

Q. No.5 Write about Hybrid techniques for in line print production.

OR

Q. No.5 Write about Hybrid techniques for off line print production.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT707A — **Max Time: 3 Hours**
Course Title: Paper Substrate in Packaging — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 **Write Short on followings:**

(a) Soft wood

(b) Kraft paper

(c) Deinking process

(d) Grain direction of paper

(e) Sources of cellulose for paper

(f) Pulping

(g) Rub resistance property

PART –II

Q. No.2 Discuss various fibrous and non-fibrous materials used in manufacturing of paper.
OR
Q. No.2 Explain various stages carried out for preparing of pulp starting from wood harvesting.

Q. No.3 What do you mean by pulping? Explain types of pulping processes.
OR
Q. No 3 What is chemical recovery process? Explain its main functions in pulp and paper industry.

Q. No.4 What do you mean by recycled paper? Discuss various steps carried out in recycling waste papers.
OR
Q. No .4 Explain the working of paper making machine and surface treatment operation.

Q. No.5 Discuss various optical and fundamental properties of paper and their importance in packaging.
OR
Q. No.5 Explain the testing and measuring of Abrasion and crush resistance.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT701A **Max Time: 3 Hours**
Course Title: Print Entrepreneurship **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 **Write Short notes on followings:**

(a) Entrepreneurship

(b) Advantages of franchise

(c) MLM

(d) Market research

(e) Human Resource Management

(f) Risk Management

(g) Entrepreneurship Development

PART –II

Q. No.2 What is entrepreneurship? Explain about the significance of entrepreneur in economic development.

OR

Q. No.2 Write a detailed note on types of Entrepreneur.

Q. No.3 Explain various steps needed to start own business in detail.

OR

Q. No 3 What do you understand by Franchise? Explain also its functions and features.

Q. No.4 Explain about the contents and formulation of project and feasibility reports.

OR

Q. No .4 Explain benefits and requirements of business planning process.

Q. No.5 Discuss forms of business organization with their advantages and disadvantages.

OR

Q. No.5 What do you understand by EDP? Discuss its objectives in detail.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 705A — **Max Time: 03 Hours**
Course Title: Printing Ink Technology — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1. Write a short note on the following

(a) Inorganic pigments.

(b) Pigment

(c) Viscosity

(d) Mixing

(e) Ball Mill

(f) Grinding control

(g) Rub resistance

PART –II

Q. No.2. Define vehicle. Explain vehicles for liquid and paste inks used in printing inks.

OR

Q. No.2. Discuss in details about additives used in printing inks in detail.

Q. No.3. Explain the absorption, evaporation, oxidation and polymerization drying mechanism of printing inks in detail.

OR

Q. No 3. Write about units of viscosity, factors influencing viscosity, and simple low-viscosity inks.

Q. No.4. Explain the optical and rheological properties of inks used in printing.

OR

Q. No .4. Write about latest trends and developments in the ink manufacturing process.

Q. No.5. Explain special security features used in printing inks in detail.

OR

Q. No.5. (a) Write about tests for chemical resistance and control of drying time. 07 Marks

(b) Write about Nano inks used in the printing industry. 07 marks

Central University of Haryana
V/VII & Re-Appear VI Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 307A — **Max Time: 03 Hours**
Course Title: Basics of Printing and Packaging Technology — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1. Write a short note on the following
(a) Applications of the letterpress printing process
(b) Fountain Roll
(c) Screen Printing
(d) Packaging
(e) Primary packaging
(f) Blister packaging
(g) Shrink packaging

PART –II

Q. No.2. Explain types of flexography press in detail.

OR

Q. No.2. Write about the classification of letterpress printing machines in detail.

Q. No.3. Write about the gravure printing process and explain the different units of gravure printing machine.

OR

Q. No 3. Define the digital printing process and explain the application, advantages & disadvantages of the digital printing process.

Q. No.4. Explain the functions & roles of packaging in detail.

OR

Q. No .4. Write about flexible, rigid, and semi-rigid packages in detail.

Q. No.5. Explain the components of corrugated board, flutes, and stages in the preparation of corrugated board.

OR

Q. No.5. Write the production steps of folding cartons and their types.

Central University of Haryana
V/VII & Re-Appear VI Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Printing and Packaging Technology

Course Code: BT PPT 307A — **Max Time: 03 Hours**
Course Title: Basics of Printing and Packaging Technology — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1. Write a short note on the following
(a) Applications of the letterpress printing process
(b) Fountain Roll
(c) Screen Printing
(d) Packaging
(e) Primary packaging
(f) Blister packaging
(g) Shrink packaging

PART –II

Q. No.2. Explain types of flexography press in detail.
OR
Q. No.2. Write about the classification of letterpress printing machines in detail.

Q. No.3. Write about the gravure printing process and explain the different units of gravure printing machine.
OR
Q. No 3. Define the digital printing process and explain the application, advantages & disadvantages of the digital printing process.

Q. No.4. Explain the functions & roles of packaging in detail.
OR
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Q. No.5. Explain the components of corrugated board, flutes, and stages in the preparation of corrugated board.
OR
Q. No.5. Write the production steps of folding cartons and their types.

Central University of Haryana
ODD Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science & Engineering

Course Code: BT CS 601A — **Max Time:3 hour**
Course Title: Principle of Operating System — **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 [2X7=14]

a. Explain the requirements of the Operating System.
b. Compare among preemptive and non-preemptive scheduling?
c. Briefly explain the counting semaphores.
d. Define the term Waiting time and Response time in reference to scheduling algorithms.
e. Write about the following file attributes (i) identifier, (ii) location, (iii) protection, and (iv) type.
f. Explain the term deadlock in brief.
g. Discuss the Backdoor security threat.

PART –II

Q. No.2

a. Describe the process control block in detail. [8]
b. Discuss the following operating systems (i) multiprocessor, (ii) distributed and (iii) Time sharing. [6]

OR

c. What is an interrupt vector?
d. Explain the Storage structure of the operating system.
d. Explain the I/O operation in detail. [2+7+5]

Q. No.3

a. Discuss Readers-Writers problem? Give a solution and code to the Readers-Writers problem. [10]
b. Distinguish between counting and binary semaphores. Use examples to explain. [4]

OR

c. Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Priority
P_1	2	2
P_2	1	1
P_3	8	4
P_4	4	2
P_5	5	3

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5, all at time 0.

i. Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority), and RR (quantum = 2).

ii. What is the turnaround time of each process for each of the scheduling algorithms?

iii. What is the waiting time of each process for each of these scheduling algorithms?

iv. Which of the algorithms results in the minimum average waiting time (overall processes)?

[14]

Q. No.4

a. Explain how the bit vector, linked list, and grouping free-space list are implemented? Use examples to explain the details. Discuss also the advantages and disadvantages of each technique.

b. Explain the indexed allocation technique for allocating secondary storage space. Discuss the advantages and disadvantages as well.

[9+5]

OR

b. Discuss a variety of techniques that are used to improve the efficiency and performance of secondary storage. Explain with proper examples.

[7+7]

Q. No.5

a. Discuss the attacks that are divided into three groups related to the three goals of security confidentiality, integrity, and availability

[14]

OR

b. Explain the Cryptography and Steganography techniques. [4]

c. The most sophisticated types of threats to computer systems are presented by programs that exploit vulnerabilities in computing systems. In this respect discuss the common methods like Trojan horse, logic bomb, code-injection, virus, and worms by which programs cause security breaches.

[10]

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science & Engineering

Course Code: BT CS 501A — **Max Time: 03 hrs.**
Course Title: Analysis and Design of Algorithm — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

a) Why Asymptotic notations are used? Also, formally define its type?
b) What is Recurrence relation? Compute the time complexity for the Fibonacci series generation problem.
c) Compute the time complexity of Selection sort for all the cases (best, average, worst).
d) Compute the time complexity analysis of kruskal's algorithm.
e) How dynamic programming is used to solve 0/1 knapsack problem?
f) Explain the key ideas to solve graph coloring problem using dynamic programming.
g) What is randomized algorithm? Name a few standard randomized algorithm.

PART –II

Q. No.2 What are the key components of Quicksort algorithm? Explain the pseudo code of it with a suitable example. (14 marks)

OR

Q. No.2

a) What are the necessary conditions that need to satisfied before applying Binary search? Write the pseudo code of Binary search algorithm. (07 marks)
b) Why Merge sort algorithm is called to be an outplace algorithm? Derive the time and space complexity for the same? (07 marks)

Q. No.3

a) Discuss the general ideas to solve the problem using Greedy method. How knapsack problem can be solved using greedy method? (07 marks)
b) Derive the time complexity of the Job sequencing with deadlines problem. (07 marks)

OR

Q. No 3 What are the well known algorithms used to solve the Single Source Shortest Path problem? Explain the pseudo code of one of them along with a suitable example. (14 marks)

Q. No.4

a) Define the Optimal BST problem? Explain the algorithm with a suitable example? (07 marks)

b) Write the pseudo code to solve the Longest common Subsequence problem. (07 marks)

OR

Q. No .4 Write the optimized code in any programming language to solve the n-queens problem with space complexity O(n)? (14 marks)

Q. No.5

a) Explain any TWO algorithm for the primality testing in detail? (07 marks)

b) Write the Pollard's rho algorithm to solve integer factorization? (07 marks)

OR

Q. No.5

a) What is NP-Hard and NP-Complete problem? Compare the characteristics of NP-Hard and NP-Complete problems. (07 marks)

b) Discuss the key ideas behind the Rabin-Karp algorithm in detail? (07 marks)

Central University of Haryana

ODD Semester Term End Examination, January 2023

B.Tech. Program

Branch: Computer Science and Engineering

Course Code: BT CS 301 Max Time: 3 Hours

Course Title: Data Structures and Algorithms Max Marks: 70

Instructions:

1. Question Number **1 (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
2. Question Numbers **2**(two) to **5**(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What is a data structure? (2)

(b) Why do we need data structures? (2)

(c) Define Abstract Data Type (ADT). What are benefits of ADT? (2)

(d) What are the ways of implementing linked list? (2)

(e) List out the different ways to implement the list? (2)

(f) Explain the functions: i) Floor ii) Ceiling (2)

(g) Explain the Pointer and its merits. (2)

PART –II

Q. No.2 (a) Write an algorithm for linear search. (4)

(b) Define the algorithm and write the criteria that algorithm must satisfy (5)

(c) Write a C program to implement the Bubble sort (5)

OR

Q. No.2 (a) Develop a structure to represent the planets in the solar system. Each planet has fields for the planet's name, its distance from the sun (in miles), and the number of moons it has. Place items in each the fields for the planets: Earth and Venus. (4)

(b) Define the data structure. Explain primitive and non-primitive data structures in details. (5)

(c) What is array? How it is represented in memory? Briefly explain the concept of static and dynamic array. (5)

Q. No.3 (a) Explain the operations of singly linked lists. (4)

(b) How polynomial manipulations are performed with lists? Explain the operations. (5)

(c) Explain Stack ADT and its operations. (5)

OR

Q. No. 3 (a) Explain the applications of Stacks. (5)

(b) Explain circular queue and its implementation. (5)

(c) Explain linked list implementation of queues. (4)

Q. No.4 (a) Define Tree. Explain the tree traversals with algorithms and examples. (7)

(b) Explain binary search tree ADT in detail. (7)

OR

Q. No .4 (a) Explain Prim's algorithm with an example. (7)

(b) Explain the breadth first search algorithm. (7)

Q. No.5 (a) Write a program in C to create and store information in a text file. (7)

(b) Write a program in C to read the file and store the data into an array. (7)

OR

Q. No.5 (a) What is error-handling in C, explain with example. (7)

(b) Explain the AVL Tree by performing its insertion and deletion operations. (7)

Central University of Haryana

V/VII & Re-Appear VI Semester Term End Examination January 2023

B.Tech. Programmes

Branch: Computer Science and Engineering

Course Code: BT CS 602 A — Max Time: 3Hrs.

Course Title: Compiler Design — Max Marks:70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What do you mean by Compiler Design?

(b) Differentiate between LALR and CLR.

(c) What is Dynamic Storage Allocation?

(d) Explain the concept of top down parsing.

(e) What is ambiguity?

(f) Discuss the term LEX.

(g) Explain the concept of Operator Precedence Grammar.

PART –II

Q. No.2

a) Write short notes on functions of semantic analysis.

b) Differentiate front end and back end.

OR

Q. No.2. How to specify the tokens? Differentiate token, lexeme and pattern with suitable examples. And draw transition diagrams also.

Q. No.3 Write short notes on

i. Formats of three address code

ii. Construction syntax tree for expressions

OR

Q. No 3 Differentiate synthesized and inherited attributes with example.

Q. No.4 What is symbol table? Explain the different organization of symbol table.

OR

Q. No .4 What is an Abstract syntax tree? How to construct it? Explain by writing syntax directed definition.

Q. No.5 Explain how loop optimization can be done? How they are different from local optimizations.

OR

Q. No.5. Write a short note on-

i. Peep Hole Optimization

ii. Register Allocation in Code Generation

Central University of Haryana
Odd Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science & Engineering
Course Code: BT HUM 304 **Max Time:** 3 Hrs
Course Title: Fundamentals of Management **Max Marks:** 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 (2*7 = 14)

a) Define Decentralization?
b) Define various types of inventory?
c) Differentiate between need and want?
d) Define objectives of financial management?
e) Define Marketing Research?
f) Mention the types of various trade credits available as sources of finances?
g) Mention any four management principles of Henry Fayol?

PART –II

Q. No.2 Briefly, describe the characteristics of Human Relations approach? Explain the 'Great Illumination Experiment' performed by Elton Mayo? (14 marks)

OR

Q. No.2 State the nature and Characteristics of Controlling? Explain the process of controlling with suitable example? (14 marks)

Q. No.3 Briefly, describe the importance and objectives of Production management? Explain the main functions of Production planning and control? (14 marks)

OR

Q. No 3 Briefly, describe the various costs associated with cost of holding inventory? Explain ABC system of inventory classification with suitable examples? (14 marks)

Q. No.4 Define four P's of marketing? Explain the DAGMAR model of advertising with suitable example? (14 marks)

OR

Q. No .4 Define Advertising as well as Publicity? Discuss the nature and importance of Marketing Research? (14 marks)

Q. No.5 Define nature and scope of Financial Management? Explain the importance as well as various long terms sources of finance available for firms? (14 marks)

OR

Q. No.5 Define Optimal Capital Structure? Describe in detail the various forms in which firms can borrow funds from banks? (14 marks)

Central University of Haryana
ODD Semester Term End Examination January 2023
B.Tech. Programme
Branch: Computer Science and Engineering

Course Code: BT CS 622
Course Title: Unix and Linux Programming

Max Time: 3 Hours
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks. (Each sub-part carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each.

PART -I

Q. No.1

(a) Discuss the salient features of Unix operating system.

(b) What are shell responsibilities?

(c) Explain the following commands

i) echo

ii) cs

iii) who

iv) date

(d) Explain how to display the terminal characteristics of UNIX operating system.

(e) What are the different ways of setting file permissions?

(f) Briefly discuss the sort command with its options.

(g) What do you mean by zombie process?

PART –II

Q. No.2

(a) Explain the unix architecture with a neat diagram. (7)

(b) Explain the shell features of "while" and "for" with syntax. (7)

OR

Q. No.2

(a) How can you say that Unix operating system provides more security than other operating systems? (7)

(b) Write a shell script to count the number of vowels in a given string. (7)

Q. No.3

(a) Explain talk and write command. (4)

(b) List all the commands associated with sendmail with its actions performed. (4)

(c) What would be the effect of the following commands: (6)

(i) grep"^[A - Z]" file1

(ii) egrep "UNIX|Unix|unix" file1

(iii) grep "UNIX$" file1

OR

Q. No 3

(a) Explain the pipe command with example. (6)

(b) Explain the egrep with + command with example. (8)

Q. No.4

(a) Define vi Editor and explain its modes. Brief about the commands used in the vi Editor. (10)

(b) Write the syntax of the following system calls and explain with an example code.
a.) rmdir b) mkdir (4)

OR

Q. No .4

(a) How to debug using GDB in linux? Explain with example. (8)

(b) Design the static and dynamic library in Unix. Differentiate between the static and dynamic library. (6)

Q. No.5

(a) What is the difference between foreground process and background process? (4)

(b) How to do authentication in Linux. (6)

(c) Write an awk script to find the largest of 10 integers. (4)

OR

Q. No.5

(a) What is the difference between corn job and batch job? (6)

(b) What are the signals and how signal handlers handle the signals? Please explain in details. (8)

Central University of Haryana
V Term End Examination, January 2023
B.Tech. Programmes
Branch: Computer Science and Engineering

Course Code: BT CS 504A | Max Time: 3 Hours
Course Title: Microprocessor and Interfacing | Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) State the difference between 8085 and 8086 microprocessor. (2 marks)

(b) Why data bus is bi-directional? (2 marks)

(c) Difference between HLT and NOP instructions? (2 marks)

(d) There are four types of shift instructions: shift logical left, shift logical right, shift arithmetic left (SAL), and _____? (2 marks)

(e) Difference between Static RAM and Dynamic RAM? (2 marks)

(f) In Zero-address instruction, operands are stored in stack or accumulator? (2 marks)

(g) Which IC is used to perform parallel communication operation?

1. 8251
2. 8252
3. 8254
4. 8255

(2 marks)

PART –II

Q. No.2 Draw and explain the signal and pin diagram of 8086 microprocessor

OR

Q. No.2 Draw and explain the block diagram of 8086 microprocessor.

(14 marks)

Q. No.3 Explain any 7 Addressing modes with the examples.

OR

Q. No. 3 Explain any 3 string manipulation instructions with example.

(14 marks)

Q. No.4 Write a program for conversion of a BCD number into Binary number.

OR

Q. No .4 Mention the procedure for Memory Interfacing of RAM having odd and even memory.

(14 marks)

Q. No.5 Draw the block diagram of 8255 and explain its working. What is control word of 8255?

OR

Q. No.5 Write brief notes on the following:

(a) Programmable Interval Timer

(b) A/D Converter

(14 marks)

Central University of Haryana
Odd Semester Term End Examination January 2023
B. Tech. Programme
Branch: Computer Science & Engineering

Course Code: BT MT 301 **Max Time: 3 Hours**
Course Title: Mathematics-III **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries a total of 14 marks (Each sub-Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q 1.

a) Find $\mathcal{L}^{-1}\left\{\frac{2s+1}{s^2-4}\right\}$?

b) Find the solution of Bernoulli equation $dx - (x^2y^3 + xy)dy = 0$.

c) Define Fourier transform in complex form.

d) Find a homogeneous linear differential equation with real coefficients of lowest order which has $x^2e^{2x} + 2e^{-2x}$ as the particular solution.

e) Find the Laplace transform of $\mathcal{L}\left\{t^{\frac{3}{2}}\right\}$?

f) Find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$, if $u = \cos^{-1}\left(\frac{x^3+y^3+z^3}{ax+ay+az}\right)$.

g) Find the Jacobian $\frac{\partial(u,v)}{\partial(x,y)}$ if $u = x\sin y, v = y\sin x$.

PART –II

Q 2.

a) Find the general solution of the equation $(D^2 + 2D + 1)y = e^{-2x}.\mathrm{Sin}(e^{-x})$.

b) Solve the differential equation $\frac{dy}{dx} = \frac{1}{(1+x^2)}(e^{\tan^{-1}x} - y)$.

OR

Q 2.

a) Solve the differential equation $(2x+5)^2y'' - 6(2x+5)y' + 8y = 6x$

b) Find the solution of the differential equation $(2y^2 + 4x^2y)dy + (4xy + 3x^3)dy = 0$

Q3.

a) I) If $f(x,y) = \begin{cases} If\ f(x,y) = \frac{x^3-y^3}{x^3+y^3}, for\ (x,y) \neq (0,0) \\ = 15,\ at\ (0,0) \end{cases}$. Show that f is discontinuous at origin.

II) If V is a function of u, v where $u = x - y$ and $v = xy$. Show that

$$x\frac{\partial^2 V}{\partial x^2} + y\frac{\partial^2 V}{\partial y^2} = (x+y)\left(\frac{\partial^2 V}{\partial u^2} + xy\frac{\partial^2 V}{\partial v^2}\right).$$

b) Find the maximum and minimum distances of the point (3,4,12) from the unit sphere with centre at origin.

OR

Q 3.

a) I) Find the extrema of $f(x,y) = (x^2 + y^2)e^{6x+2x^2}$.

II) Find Taylor's expansion of $f(x,y) = \cot^{-1} xy$ in the powers of $(x + 0.5)$ and $(y - 2)$ up to second-degree terms. Hence compute $f(-0.4,2.2)$ approximately.

b) I) Determine whether the functions are functionally dependent or not. If

$$u = \frac{x^2-y^2}{x^2+y^2}, v = \frac{2xy}{x^2+y^2}.$$

II) Using Leibnitz's rule solve the integral $\int_0^1 x^m (logx)^n dx$.

Q 4.

a) I) Using Laplace transform show that the $\int_{t=0}^{\infty} \int_{u=0}^{t} \frac{e^{-t} \sin u}{u} du\, dt = \frac{\pi}{4}$.

II) Find the Laplace transform of the function $f(t) = \begin{cases} t^2, & 0 < t < 2 \\ 4t, & t > 2 \end{cases}$

b) Solve the differential equation using Laplace transform $y'' - 2y' - 8y = 0, y(0) = 3, y'(0) = 6$.

OR

Q 4.

a) I) Find the inverse Laplace transform of the function $\frac{(s+1)e^{-\pi s}}{(s^2+s+1)}$.

II) Find the inverse Laplace transform of the function $\frac{1}{2} \ln \left[\frac{s^2+b^2}{s^2+a^2}\right]$.

b) Find the inverse Laplace transform of the function using convolution: $\frac{1}{(s^2+4)(s+1)^2}$

Q 5.

a) Find the inverse Fourier cosine transform of the function $\frac{\sin as}{s}$

b) Find the Fourier series of the function $f(x)$ which are periodic with period 2π. Where

$$f(x) = \begin{cases} 0 & for -\pi < x \leq 0 \\ x & for \quad 0 < x \leq \pi \end{cases}$$

Deduce $\frac{\pi^2}{0} = \sum_{n=1}^{\infty} \frac{1}{(2n-1)^2}$.

OR

Q 5.

a) Obtain the Fourier series expansion of $f(x) = \frac{(\pi-x)}{2}, 0 < x < 2$.

b) Find the Fourier sine transform of the function $f(x) = e^{-ax}$ for $x \geq 0$, and deduce the integral known as $\int_0^{\infty} \frac{\cos \alpha x}{a^2+\alpha^2} d\alpha$.

Central University of Haryana
Re-Appear VI Semester Term End Examination, January 2023
B.Tech. Programmes
Branch: Computer Science and Engineering

Course Code: BT CS 603A | Max Time: 3 Hours
Course Title: Software Engineering | Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Depict any 2 software metrics. (2 marks)

(b) What is the biggest risk in project scheduling, explain. (2 marks)

(c) Explain KLOC for estimation. (2 marks)

(d) Differentiate verification and validation with example. (2 marks)

(e) What is ISO 9000? (2 marks)

(f) What is refactoring? (2 marks)

(g) Explain any two CASE tools (2 marks)

PART –II

Q. No.2 What is software development process models, explain.

OR

Q. No.2 Explain functional specification with use case.

(14 marks)

Q. No.3 Explain project scheduling and staffing in a case of library management software for the university.

OR

Q. No. 3 Explain the risk management steps while forming the library management software for the university.

(14 marks)

Q. No.4 Write the note on following:

a) OO design concept

b) OO design methodology

OR

Q. No .4 Explain the Cost estimation models COCOMO with example.

(14 marks)

Q. No.5 Write short notes on:

a) White-box testing

b) Black-box testing

OR

Q. No.5 What are the components of CASE tools?

(14 marks)

Central University of Haryana
Odd Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science & Engineering

Course Code: BT CS 503A **Max Time:3 hour**
Course Title: Computer Network **Max Marks:70**
Semester: V

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 [2X7=14]

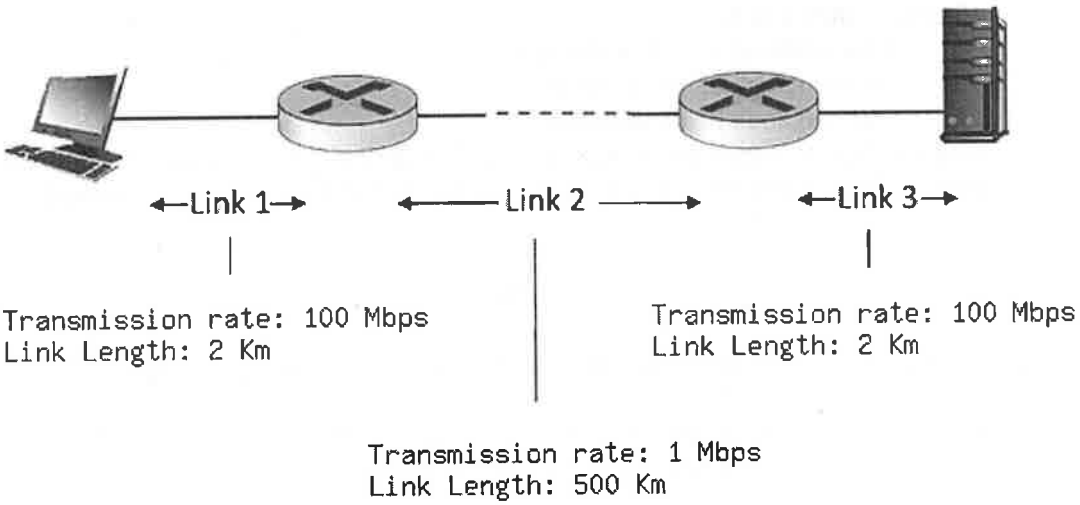
a. Name all the components of data communication systems.
b. What is Queuing and Transmission Delay.
c. Compare TCP and UDP protocol.
d. Write the points that needs to be considered while designing subnets.
e. Define forwarding and routing.
f. What is p-persistent method?
g. Discuss two services provided by the Data link layer.

PART –II

Q. No.2

a. Explain circuit switched network and packet switched network in detail. Use example for proper explanation. Also compare both of them. [4+3]

b. Consider the figure below, with three links, each with the specified transmission rate and link length.



Assume the length of a packet is 8000 bits. The speed of light propagation delay on each link is 3x10^8 m/sec. Round your answer to two decimals after leading zeros. Answers should be in seconds.

i. What is the transmission delay of link 1?
ii. What is the propogation delay of link 1?
iii. What is the transmission delay of link 2?

iv. What is the propogation delay of link 2?
v. What is the transmission delay of link 3?
vi. What is the propogation delay of link 3?
vii. What is the total delay?

[7]

OR

c. Briefly explain the HTTP protocol. Also discuss HTTP with respect to Non-persistence connection and its drawback. [4+3]
d. Describe ISO/OSI reference model in detail. [7]

Q. No.3

a. Describe UDP checksum mechanism with an example. [4]
b. Why UDP provides checksum mechanism? [3]
c. Discuss the different problems of reliable data transfer protocol rdt2.0. Also discuss the solution to the discussed problem [7]

OR

d. Discuss the principle of congestion control with respect to the following cases
   i. Two senders and a router with infinite buffers.
   ii. Two senders and a router with finite buffers.
   iii. Four senders and routers with finite buffers and multihop paths. [4+5+5]

Q. No.4

a. Explain the network layer virtual-circuit service and datagram service in detail. [7]
b. An organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblock of addresses to use in its three subnets as shown below:
   i. One subblock of 120 addresses
   ii. One subblock of 60 addresses
   iii. One subblock of 10 addresses

   Find number of addresses allocated to each subblock, the first address and the last address of the subblocks. Also find the unallocated addresses that are reserved. [7]

OR

c. By the help of an example, explain the Distance vector routing algorithm. [8]
d. Discuss the following special addresses (i) limited broadcast address, (ii) Loopback address, (iii) Multicast address, (iv) Direct Broadcast Address [6]

Q. No.5

a. Derive the throughput of pure ALOHA. [7]

b. Write short notes on the following

   i. Frame Relay

   ii. Parity Checking, [3.5+3.5]

OR

c. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces (i) 1000 frames per second (ii) 500 frames per second and (iii) 250 frames per second. Explain the answer with reason. [6]

d. Describe CSMA/CD protocol in detail. [8]

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science & Engineering

Course Code: BT CS 521
Course Title: Programming with Python

Max Time: 03 Hrs.
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

a) What are immutable variables? Explain the usage of immutable variables with a suitable example.
b) Describe conditional statements with proper syntax and example.
c) What is list comprehension? Explain the advantage of it with a suitable example.
d) What are class and objects in python? How to define or declare them?
e) What is the meaning of Hiding Redundancy? Support your answer with a proper example.
f) Write a Python code to receive two values from user & perform the addition operations on these values.
g) Show various ways to use range() function.

PART –II

Q. No.2

a) Explain the process of reading and writing the text file with python code? (07 marks)
b) Is string in python is mutable or immutable? Justify your answer with a suitable example. (07 marks)

OR

Q. No.2

a) How slicing a string can be achieved in python? (07 marks)
b) Write the python code to reverse a string without using any inbuilt function? (07 marks)

Q. No.3

a) What are mutable and immutable data structures in python? Explain each of them with proper syntax. (07 marks)
b) Write a python program to search an element in a sorted list. (07 marks)

OR

Q. No 3 Write a python program to sort the dictionary without using any inbuilt function.

(14 marks)

Q. No.4

a) What is abstract class? Explain the usage of it using a simple example. (07 marks)

b) Describe all types of inheritance with python code example. (07 marks)

OR

Q. No .4 Create an abstract class "Sorting" where there are TWO abstract functions "sort()" and "is_empty()". Also, create TWO derived class "Linear_Search" and "Binary_Search" that derives the base class "Sorting". (14 marks)

Q. No.5 Write a program to create the "Register Student" GUI using tkinter module? This GUI has the following fields: (14 marks)

Name → Text Field

RollNumber → Text Field

Semester → Radio button

Category → Drop down menu

Submit → Button

OR

Q. No.5 Demonstrate the nested frames using a simple GUI application in tkinter. (14 marks)

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science and Engineering

Course Code: BT CS 302 **Max Time: 3Hrs.**
Course Title: Digital Electronics **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What do you mean by Digital Electronics?

(b) Differentiate between MUX and De-MUX.

(c) What is Race Around Condition?

(d) Discuss the concept of sequential circuits.

(e) What do you mean by reflective code.

(f) Define full adder with circuit diagram.

(g) What is a ripple counter?

PART –II

Q. No.2

a) Differentiate between analog and digital signal. Also discuss applications and advantages of digital signal.

b) Define Boolean Algebra. Also explain five Boolean algebraic laws.

OR

Q. No.2.

a) Write short note on-

i. Universal Gates

ii. Weighted Codes

iii. Equivalent Gray code for Binary number 110010110.

b) Simplify the following

i. $F(A,B,C,D)=\pi m(1,3,7,11,15) + d(0,2,5)$

ii. Convert 625.25 from decimal to equivalent octal number.

iii. De-Morgan's Theorem.

Q. No.3 Write short notes on

i. Don't Care Condition.

ii. Explain adder and construct full adder using NAND gates.

OR

Q. No 3 Differentiate between combinational and sequential circuits. Also discuss the concept of Decoder by taking suitable example.

Q. No.4

a) What is Flip Flop? Discuss in detail.

b) Differentiate between Ring counter and Johnson counter.

OR

Q. No .4

a) What is Counter? Discuss the working of 3-bit synchronous counter in detail.

b) What do you mean by shift registers?

Q. No.5 Define memory decoding. Compare static and dynamic RAM. Also discuss the features of RAM.

OR

Q. No.5. Write a short note on-

i. PLA and PAL

ii. Error Detection and Correction

Central University of Haryana
III Semester Term End Examination, January 2023
B.Tech. Programmes
Branch: Computer Science and Engineering

Course Code: BT CS 303 Max Time: 3 Hours
Course Title: Computer Organization & Architecture Max Marks: 70

Instructions:
Question Number **1(one) (PART-I)** is compulsory and carries total 14 (fourteen) marks (Each sub Question carries two Marks).
Question Numbers **2(two) to 5(five) (PART-II)** carry 14 (fourteen) marks each with internal choice.

PART -I

Q. No. 1
(a) Mention the historical overview for Computer organization. (2 marks)
(b) Design a 2 x 2 array multiplier. (2 marks)
(c) Mention the basic steps for Instruction Execution (2 marks)
(d) Difference between RISC and CISC? (2 marks)
(e) What is parallel and pipeline processing? (2 marks)
(f) What is concept of locality and types? (2 marks)
(g) Depict input output performance measures. (2 marks)

PART –II

Q. No. 2 Explain the fixed and floating point representation for both signed and unsigned numbers.

OR

Q. No. 2 A 7-bit hamming code is received as 1011011. Assume even parity and state whether the received code is correct or not. If not then locate the bit in error.

(14 marks)

Q. No. 3 Construct the hardware unit for Arithmetic Logic Shift unit.

OR

Q. No. 3 Explain any 3 addressing modes in detail.

(14 marks)

Q. No. 4 What are different types of pipeline conflicts/hazards? How to control them?

OR

Q. No. 4 What is memory interleaving? Explain different ways of interleaved memory with example.

(14 marks)

Q. No. 5 Explain Flynn's classification with diagrams and examples.

OR

Q. No. 5 Write brief notes on any two the following:
(a) Programmed Input/Output
(b) Interrupt Initiated Input/Output
(c) Direct Memory Access

(14 marks)

Central University of Haryana
VI Semester Term End Examination January 2023
B.Tech. Programme
Branch: Computer Science and Engineering

Course Code: BT CS 633 **Max Time: 3:00 Hrs**
Course Title: Distributed Systems

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What is a Distributed system?
(b) What is not true about Distributed Systems _____
(i) It is a collection of processors (ii) All processors are synchronized
(ii) They do not share memory (iv) None of these
(c) What is the difference between RMI and RPC?
(d)Explain the term mutual exclusion in distributed systems.
(e) Is DSM is a part of Distributed computing? Explain.
(f) What is a nested distributed transaction?
(g) How atomic commit protocol is used in distributed file systems?

PART –II

Q. No.2 What are the issues and challenges in distributed system design? Give the examples of distributed systems.

OR

Q. No.2 Explain the ONC RPC model? How dynamic port mapping occurs in designing the distributed applications.

Q. No.3 Describe any one method of Logical clock synchronization with the help on an example.

OR

Q. No 3 Explain the Centralized algorithms for Mutual Exclusion in Distributed Systems.

Q. No.4 What are the approaches used to detect deadlock in the distributed systems? Differentiate between Path-Pushing and Edge-chasing algorithms.

OR

Q. No .4 Explain the Design and Implementation issues in Distributed Shared Memory.

Q. No.5 What is the goal of transaction? Describe the rules for committing the nested transaction.

OR

Q. No.5 What is the distributed file systems? Explain the Two phase commit protocol.

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Computer Science and Engineering

Course Code: BT CS 502 A
Course Title: Theory of Computation

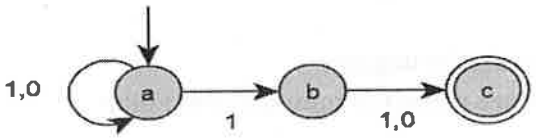
Max Time: 3Hrs.
Max Marks:70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 (2X7=14)

(a) What do you mean by ambiguous grammar? Explain by using suitable example.
(b)Convert the given NFA into DFA.



(c) What is recursively enumerable language?
(d) Explain the concept of Pumping Lemma.
(e) What is Turing machine?
(f) Discuss Arden's Theorem.
(g)How to decide that a given problem is undecidable?

PART –II

Q. No.2

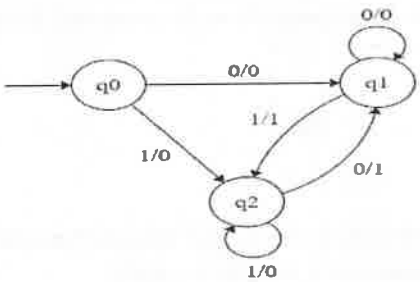
a) Explain the Minimization of DFA by taking a suitable example. (2)
b) Construct a deterministic finite automaton for accepting all the strings with even number of a's and odd number of b's. (2)
c) Construct the deterministic finite automata for accepting the set of all strings with three consecutive 0's. (3)

OR

Q. No.2

a) Distinguish NFA and DFA with examples. (2)

b) Convert the given Mealy machine into equivalent Moore machine. (2)



c) Explain pumping lemma for regular sets. (3)

Q. No.3

a) Convert the given Context Free Grammar into GNF. (8)

$S \rightarrow XA|BB$

$B \rightarrow b|SB$

$X \rightarrow b$

$A \rightarrow a$

b) Simplify the Context Free Grammar. (6)

S -> abS | abA | abB

A -> cd

B -> aB

C -> dc

OR

Q. No.3

a) Explain the relation between classes of language. (7)

b) What is the use of Equivalence classes to minimize the Finite Automata? (7)

Q. No .4

a) Write down the Closure properties of Context Free Languages. (7)

b) Design a PDA for the language such that (7)

$L= \{ a^n b^m a^n \quad | n, m>=1 \}$

OR

Q. No.4

a) Design a Turing Machine for odd length palindrome. Also discuss the approach to be used. (7)

Q. No.4

b) . Write a short note on-

i) Chomsky Hierarchy (3.5)

ii) Halting Problem (3.5)

Q No. 5. What is the decidability problem in languages how, to overcome the problem of decidability? (14)

OR

Q.No. 5.

(a) Describe the mathematical relation between recursive and recursive enumerable problem.

(b) Explain the Post correspondence problem with suitable example.

Central University of Haryana
III/V Semester Term End Examination Jan 2023
B.Tech. Programmes
Branch: All branch (2nd year)

Course Code: **BT EE306A** **Max Time: 3hrs**
Course Title: **MEASUREMENTS AND INSTRUMENTATION** **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carry two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Question No.1 Write short note on:

(a) The Wien's bridges is suitable for the measurement of frequency of the range of .....

(b) What is the mean by real, true and actual value in the network?

(c) Megger is a ..... type instrument.

(d) What is the power factor?

(e) The two watt meters used for the measurement of power input read 50 kW each. What will be the readings of the two watt meters if the power factor is changed to 0.8 leading keeping the total input power same?

(f) ..... Instruments measure the total quantity of electricity delivered at a particular time.

(g) What is the role of bridges in the network?

PART –II

Unit-I

Question No.2 (a) How many methods used in instrument to providing controlling torque? Explain in details. (7)

Question No.2 (b) With the help of diagram explain the Classification of Instruments. (7)

Or

Question No.2 (a) Explain the Generalized Instrument with the help of block diagram. (7)
Question No.2 (b) Define the following terms: (a) Accuracy (b) Precision (c) Resolution (d) Threshold (e) Sensitivity (7)

Unit-II

Question No.3 (a) What is the voltmeter? Explain its construction and working. (7)

Question No.3 (b) How to work the Moving iron type Instruments? Explain in details. (7)

Or

Question No.3 How to extend the range of the ammeter and voltmeter? Explain in detail.(14)

Unit-III

Question No.4 (a) Discuss different types of frequency meters used in practice? (7)

Question No.4 (b) Explain how three phase power factor meters gives indications which are independent of waveform shape and frequency? (7)

Or

Question No.4 (a) With the help of diagram explain the construction and working of watt meter. (7)

Question No.4 (b) Explain the energy meter with detail. (7)

Unit-IV

Question No.5 What is the method of Kelvin's double bridge follow to measurement the low resistance? Explain in detail. (14)

Or

Question No.5 Write the short note of

a. Wein's bridges (7)

b. Hays Bridge (7)

Central University of Haryana
VI reappear Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: EE328A **Max Time: 3Hrs.**
Course Title: Digital Control System **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1
(a) Give the table to show the mathematical comparison between analog and digital control systems. Also give the advantages of digital control system over analog control system.
(b) Explain Digital Control System with the example of Closed-Loop Drug Delivery System or Aircraft Turbojet Engine.
(c) Explain the steps involved in Analog to Digital Conversion.
(d) Analog pressures are recorded using a pressure transducer as voltages between 0 and 3 V. The signal must be quantized using a 3-bit digital code. Indicate how the analog voltages will be covered to digital values.
(e) Explain the Dynamic Range.
(f) For each of the following difference equations, determine the (a) order of the equation (b) linearity (c) time invariance (d) homogeneity.

$$y(k+2)+0.8y(k+1)+0.07y(k)=u(k)$$

(g) Obtain the z-transform of the sequence:

$$\{u_k\}_{k=0}^{\infty}=\{1,\ 1,\ 3,\ 2,\ 0,\ 4,\ 0,\ 0,\ 0,\ldots\}$$

PART –II

Q. No.2 (a) Explain relation between Laplace Transform and Z-Transform with Conformal Mapping between s-plane to z-plane.

OR

Q. No.2 (b) Find the z-transform of following causal sequences.

$$1.\ f(k)=2\times 1(k)+4\times\delta(k)$$

$$2.\ f(k)=\begin{cases}4, & k=2,3,..\\ 0, & otherwise\end{cases}$$

Q. No.3 Obtain the inverse z-transform of the below function using long division method:

$$\sum_{k=0}^{n} a^k=\frac{1-a^{n+1}}{1-a},\ a\neq 1$$

OR
Q. No 3 Obtain the unit impulse response of the open-loop sampled data system shown in Fig.1

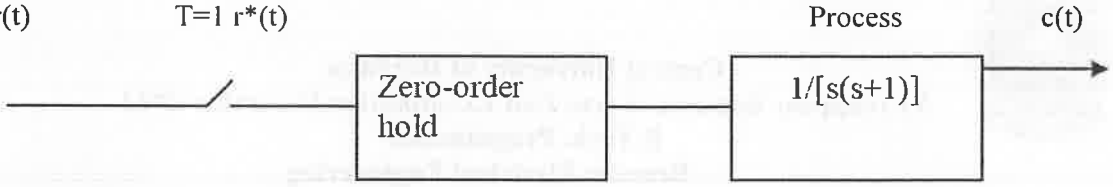


Fig.1

Q. No.4 (a) Find $G_{ZAS}(z)$ for the cruise control system for the vehicle shown in figure, where u is the input force, v is the velocity of the car, and b is the viscous friction coefficient.

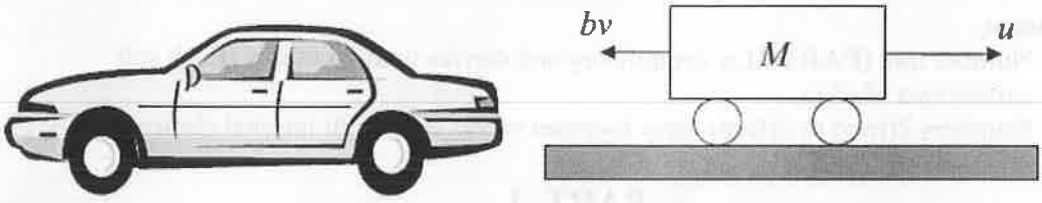


Fig.2

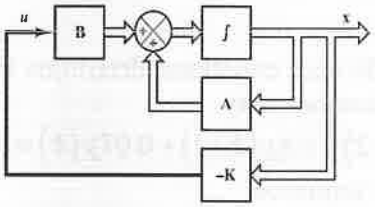
OR

Q. No .4 Test the stability of the polynomial using Jury's Test:

$$F(z) = z^5 + 2.6z^4 - 0.56z^3 - 2.05z^2 + 0.0775z + 0.35 = 0$$

Q. No.5 (a) Consider the regulator system shown in following figure. The plant is given by :

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -6 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} u(t)$$



The system uses the state feedback control u=-kx. The desired eigenvalues are μ_1=-2+j4, μ_2=-2-j4, μ_3=-1. Determine the state feedback gain matrix K using Ackermann's Formula.

OR

Q. No.5 Determine the observability and detedtability of the system

$$\begin{bmatrix} x_1(k+1) \\ x_2(k+1) \\ x_3(k+1) \end{bmatrix} = \begin{bmatrix} -0.4 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & -2 \end{bmatrix} \begin{bmatrix} x_1(k) \\ x_2(k) \\ x_3(k) \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 0 & 0 \\ 1 & 1 \end{bmatrix} u(k)$$

$$y(k) - \begin{bmatrix} 1 & 1 & 0 \end{bmatrix} \begin{bmatrix} x_1(k) \\ x_2(k) \\ x_3(k) \end{bmatrix}$$

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch:

Course Code: BT EE701A
Course Title: Electric Drives

Max Time: 3 hrs
Max Marks:70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Compare ac and dc drive.
(b) Define steady state stability. What is the condition of system's steady state stability?
(c) Why is short time rating higher than continuous rating?
(d) What do you understand by Plugging.
(e) What do you mean by transient operation of induction motor drive.
(f)List the speed control methods of DC motor drives. Explain in brief.
(g) Write the essentials conditions to start induction motor drives.

PART –II

Q. No.2 Explain the term load equalization. How is it done? Derive the formula for moment of inertia of flywheel?

OR

Q. No.2 Explain different modes of operation of an Electric drive.

Q. No.3 State and explain about classes of motor duty.

OR

Q. No 3 Why energy conservation is important in electrical drives? List the measures that could be taken to conserve the energy in electrical drives? Which type of losses takes place in electrical drives?

Q. No.4 Draw and explain speed-torque characteristics of DC motor.

OR

Q. No .4 State and explain the important features of various braking methods of dc motor drive. Draw the speed-torque characteristics of reverse voltage braking?

Q. No.5 What is slip power recovery? Explain speed control of induction motor using slip energy recovery scheme.

OR

Q. No.5 Describe the principle of operation of a switched reluctance motor. Write disadvantages and advantages of the same.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE706A **Max Time: 3Hrs.**
Course Title: A Nonlinear and Optimal Control System **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

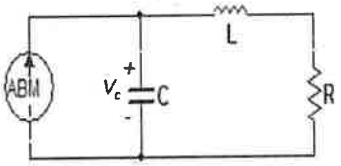
PART -I

Q. No.1
(a) Define essential nonlinear phenomena in terms of: A. Finite escape time B. Multiple isolated equilibria C. Limit cycle
(b) In vector field diagram if $f(x) = (2x_1^2, x_2)$ for x = (1, 1), what is the next point?
(c) Define phase plane analysis with limitation.
(d) Explain equilibrium point and its stability.
(e) Write necessary and sufficient conditions for a differentiable function f to take on a minimum value at point x^*.
(f) Explain the mathematical statement of Aizerman's conjecture.
(g) Discuss two models predictive control of Stochastic control.

PART –II

Q. No.2 For the RLC circuit draw the state space trajectory with following initial conditions.

$$\begin{bmatrix} v_c(0) \\ i_L(0) \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$$



OR
Q. No.2 Find the equilibrium point(s) of each nonlinear system given below.

a) $\dot{x} = xy - 3y$, $\dot{y} = xy - 3x$

b) $\dot{x} = x^2 - 3xy + 2x$, $\dot{y} = x + y - 1$

c) $\dot{x} = x^2 + y^2 - 13$, $\dot{y} = xy - 2x - 2y + 4$

d) $\dot{x} = x^2y + 3xy - 10y$, $\dot{y} = xy - 4x$

e) $\dot{x} = 2 - x^2 - y^2$, $\dot{y} = x^2 - y^2$

Q. No.3 Explain Lyapunov's second criterion of stability with all expressions and example.
OR
Q. No 3 Using variable gradient method, find the stability of the system represented by equations: $\dot{x}_1 = x_2$ and $\dot{x}_2 = -x_2 - x_1^3$.

Q. No.4 Consider a system with state equations $\dot{x}_1(t) = x_2(t)$ and $\dot{x}_2(t) = -x_2(t) + u(t)$. The performance index to be minimised is $J = \frac{1}{2}\int_{t_o}^{t_1}(x_1^2+u^2)\,dt$. The control inequality constraints are $|u(t)| \leq 1$ for $t \in [t_0\ , t_1]$. The Pontryagin's function is

$\mathcal{H}(x,u,\lambda,y) = \frac{1}{2}x_1^2 + \frac{1}{2}u^2 + \lambda_1 x_2 - \lambda_2 x_2 + \lambda_2 u$

Determine the control that minimise $\mathcal{H}$.

OR

Q. No .4 Suppose that the system $\dot{x}_1(t) = x_2(t)$ and $\dot{x}_2(t) = u(t)$Is to be controlled to minimize the performance measure $J(x,u) = \frac{1}{2}\int_0^2 u^2 \mathrm{dt}$. Find a set of necessary condition for optimal control using Hamiltonian method.

Q. No.5 Explain in details about stochastic optimal control with utilisation and examples.

OR

Q. No.5 Explain Discrete time Linear state Regulator

Central University of Haryana
ODD Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE707A
Course Title: Smart Grid

Max Time: 3hrs
Max Marks:70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define smart grid concept and explain its necessity?

b) Explain the concept of resilient and self-healing grid?

(c) Explain phasor measurement unit?

(d) What is smart substation?

(e) Explain the role of EMC and power quality in smart grid?

(f) Explain power quality conditioner in smart grid?

(g) What is microgrid? Mention some application of microgrid?

PART –II

Q. No.2

Describe the opportunities and challenges relate to smart grid? Differentiate between conventional grid and smart grid?

OR

Q. No.2

What are the present development and international policies in smart grid?

Q. No.3

Explain how smart meter can be play an important role to make a system smart and describe its component in brief?

OR

Q. No 3

What are the communication infrastructure and protocols for smart meter? Differentiate between HAN, NAN and WAN?

Q. No.4

Formulate a Demand side integration algorithm for a Hybrid renewable energy system and energy management system?

OR

Q. No .4

What are the needs of microgrid and explain protection and control microgrid? Explain Islanding and its benefits?

Q. No.5

Describe the power quality issues of grid connected renewable energy sources?

OR

Q. No.5

What is Broadband over power line? Explain working and feature of Broad band over power line?

Central University of Haryana
V Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BT EE 501A **Max Time: 3Hrs.**

Course Title: Power Electronics **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

a) (Draw and explain the forward characteristics of SCR using two transistor model of SCR
b) Compare the performance characteristics of MOSFET with BJT. (ii) What is the difference between primary and secondary breakdown in a power transistor?
c) Discuss the operation of power MOSFET and explain the transfer, output and switching characteristics of power MOSFET.
d) Explain with diagram the various modes of working of TRIAC.
e) A forward voltage is applied to an SCR soon after reverse recovery current drops nearly to zero value. Discuss, in brief, what would happen to SCR.
f) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input DC voltage & duty cycle.
g) Define voltage ripple factor.

PART –II

Q. No.2 A Chopper circuit is operating on TRC at a frequency of 2 kHz on a 460 V supply. If the load voltage is 350 volts, calculate the conduction period of the thyristor in each cycle.

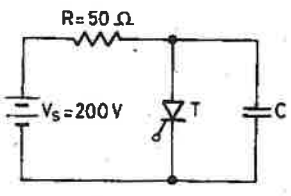
OR

In an ideal type A chopper circuit, the supply voltage is 250V, chopping frequency is 300Hz, duty cycle 0.5 , load resistance is 5 Ω and load inductance is 5mH. If the load has a back emf of 100V , find the average output current of the chopper. Also find the maximum and minimum values of steady state inductor current, and the average value of source current.

Q. No.3 Explain Complimentary commutation of the thyristor.

OR

Q. No 3 In the circuit Shown in Fig., SCR is forced commutated by circuitry not shown in figure. Compute the minimum value of C so that SCR does not get turned on due to re-applied dv/dt. The SCR has minimum charging current of 5mA to turn it on and its junction capacitance is 25 pF.

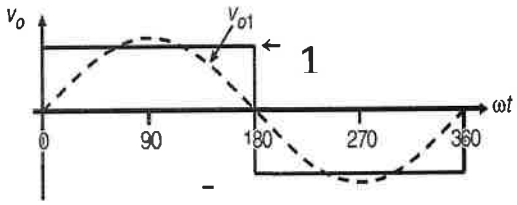


Q. No.4 A single phase full wave ac regulator has a resistive load of 5Ω while the input voltage is 220V, 50Hz if the required load power is 7.5 kw, find the firing angle of thyristor. What is the RMS output voltage? And also find the IPF.

OR

Determine the switching duty ratio of a buck-boost converter such that the output voltage is -28V when the input is 100V. The load is 1Ohm. Design the converter such that it will be in continuous current mode. The output voltage ripple must not be more than 0.5%. Specify the frequency and the values of each component. Suggest the power switch also.

Q. No.5 Explain operation of three phase bridge inverter employing 120° mode of operation. Draw waveforms of phase voltages and anyone line voltage assuming star connected resistive load.



OR

For a single phase full bridge inverter, Vs = 230V dc, T= 1ms. The load consists of RLC in series with R=1.2 Ω, ωL= 8 Ω, Xc= 7 Ω. Find i) the RMS value of fundamental component of load current ii) power delivered to the load due to fundamental component.

Central University of Haryana
III Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE304A
Course Title: Electrical Machines 1

Max Time: 3 Hrs
Max Marks:70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define MMF, Reluctance and Inductance?
(b) Write a short note on single and double excited systems?
(c) Distinguish between LAP and WAVE winding?
(d) Define efficiency of dc machine and give its losses?
(e) Why transformer rating is expressed in terms of kVA?
(f) Define voltage regulation of a transformer
(g) List the advantages of three – phase transformer over three single – phase transformers.

PART –II

Q. No.2 (a) Write a short note on the the influence of highly permeable materials on the magnetic flux lines.
(b) With the help of graph, explain the B-H curve of the magnetic materials. (7+7)

OR

Q. No.2 (a) Derive the expression for energy stored in the magnetic circuits.
(b) Distinguish between linear and non linear magnetic circuits. (7+7)

Q. No.3 (a) Discuss in detail, the load characteristics of DC Series and Shunt generators.
(b) A 440 V, 4-pole, 25 kW, dc generator has a wave-connected armature winding with 846 conductors. The mean flux density in the air-gap under the interpoles is 0.5 Wb/m2 on full load and the radial gap length is 0.3 cm. Calculate the number of turns required on each interpole. (7+7)

OR

Q. No 3 (a) Explain the constructional features of DC generator in detail.
b) A 4-pole generator has a wave-wound armature with 722 conductors, and it delivers 100A on full load. If the brush lead is 80 calculate the armature demagnetizing and cross magnetizing ampere turns per pole. (7+7)

Q. No.4 (a) Explain the Brake test in a dc machine.
(b) A 200 V DC shunt motor with armature and field resistances of 0.25 ohm and 200 ohm respectively, takes a no load current of 5 A. If it takes 50 A under loaded conditions, find its efficiency as generator. (7+7)

OR

Q. No .4 (a) Explain about core and shell type of transformers and their relative merits with respect to other.
(b) Draw and explain the phasor diagram of single phase transformer on load considering with winding resistance. (7+7)

Q. No.5 (a) What is auto transformer? Explain the working principle of auto transformer.

(b) With the help of neat sketch, explain in detail about parallel operation of single phase transformers.

OR

Q. No.5 (a) Explain the concept of Scott connection (three phase to two phase) conversion with a neat circuit diagram.

(b) What is the significance of Y-Y, Y-delta and Delta-Y, Delta-Delta connections in 3-phase transformers?

Central University of Haryana
III Semester Term End Examination December 2022
B.Tech. Programmes

Branch:Electrical Engineering
Course Code: BT EE 301A
Course Title:Electrical Circuit Analysis

Max Time: 3 hours
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) State duality and Dual Network.
(b) State Transfer function.
(c) What do you mean by Quality factor.
(d) Find the Laplace transform of unit step function and impulse function

(e) What do you mean by Convolution.
(f) An inductance of 8.0 mH is in series with two inductances in parallel, one of 3.0 mH and the other 6.0 mH. Find Leq.

(g) Define Transcondutance.

PART –II

Q. No.2

Obtain the Thévenin and Norton equivalents for the network shown in Fig.1

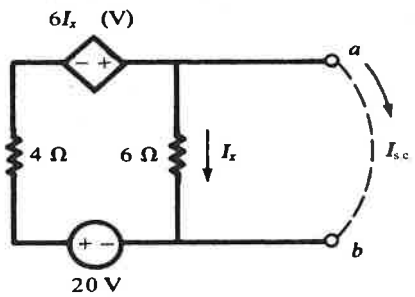


Fig. 1

OR

Q. No.2

Find the maximum power that the active network to the left of terminals ab can deliver to the adjustable resistor R in Fig. 2

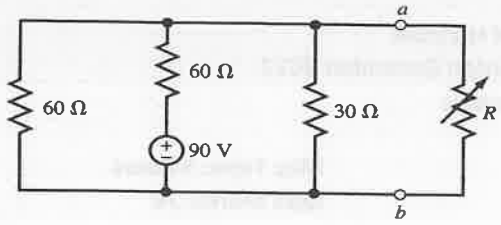


Fig. 2

Q. No.3 A 400 V, balanced three-phase supply is connected to a Y-connected load of 900 W at a power factor of 0.8 leading. Calculate the line current and the per phase load impedance.

OR

Q. No 3 Show by a phasor diagram that when three-phase balanced voltage sources are connected in delta formation, no current will flow round the loop so formed. Explain why delta-connected source is not used in practice.

Q. No.4

(a) Determine the Laplace transform of the waveform shown in Fig. 3

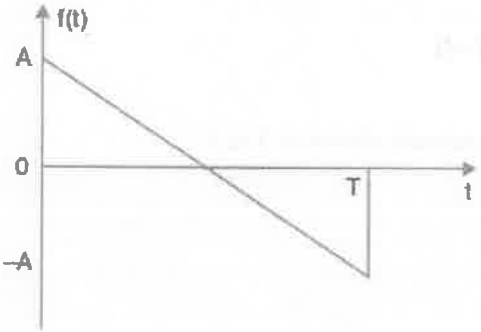


Fig. 3

(b) Draw the dual of the network in Fig. 4

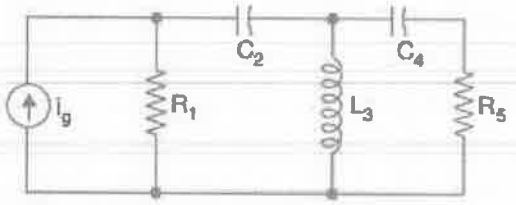


Fig. 4

OR

Q.No .4

(a) Derive the Laplace transform of the following functions:

(i) sinh *at*

(ii) 1 – exp (– *at*)

(b)The incidence matrix is given below as

Branches ⇒	1	2	3	4	5	6	7	8
A =	1	0	0	0	1	0	0	1
	0	1	0	0	−1	1	0	0
	0	0	1	0	0	−1	1	−1
	0	0	0	1	0	0	−1	0

Draw the oriented graph.

Q. No.5 . Determine the *Z*, *h*- and *Y*-parameters of the network shown in Fig.5

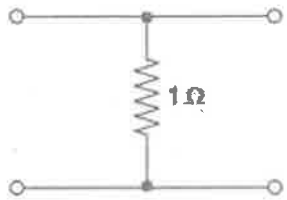


Fig. 5

OR

Q. No.5

(a) Show that when two two-port networks *N*1 and *N*2 are connected in parallel, the equivalent *Y*-parameter of the combined network is

$$Y_{equ} = Y_{N1} + Y_{N2}$$

(*b*) For the network shown in Fig.6 obtain the *Z*-parameters.

(c) Obtain the *h*-parameters of the network from the *Z*-parameters.

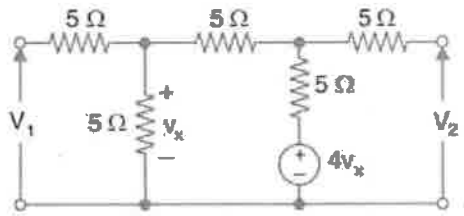


Fig. 6

Central University of Haryana
Re appear VI Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BT EE603A **Max Time: 3 Hours**
Course Title: Micro-processor & Micro-controller **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) List the 8051 interrupts with its priority.

(b) Define Stack register.

(c) What is meant by multiprogramming

(d) Illustrate the CJNE instruction.

(e) Write a 16 bit delay program in 8086

(f) What is the significance of EA pin?

(g) List the modes of Timer in 8051.

PART –II

Q. No.2 Explain the internal hardware architecture of 8086 with neat diagrams.

OR

Q. No.2 Explain about RISC and SISC processors. Also discuss about Register organization of 8086 micro- processor.

Q. No.3 Discuss the maximum mode configuration of 8086 by with a neat diagram. Mention the functions of the various signals.

OR

Q. No 3 Draw and discuss the interrupt structure of 8086 micro-processor.

Q. No.4 Explain in detail about the architecture of 8051microcontroller with neat diagram.

OR

Q. No .4 Explain about arithmetic, logic and control instruction set in 8051 micro-controller.

Q. No.5 Describe the different modes of operations of Timers/Counters in 8051with its associated registers.

OR

Q. No.5 Draw the diagram to interface the stepper motor with 8051 micro-controller and explain. Write a 8051 assembly language program to run a stepper motor in both forward and reverse direction with delay.

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: 5EE 503A
Course Title: Control Systems

Max Time: 3 Hrs
Max Marks: 70

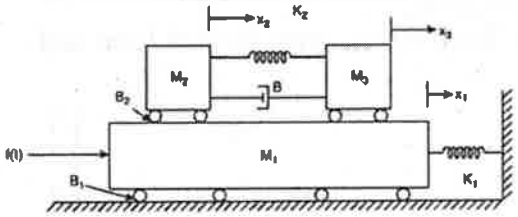
Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

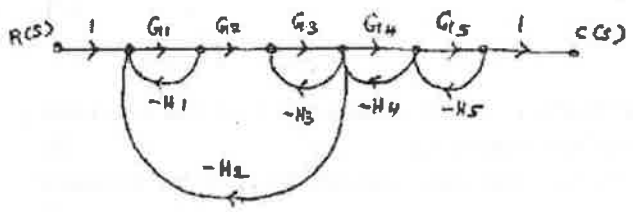
Q. No.1
(a) Give the comparison between open loop and closed loop system?
(b) Give the steady state errors to a various standard inputs for type 1 system?
(c) Write the necessary and sufficient condition for the stability in Routh Stability criterion?
(d) Explain the relationship between time domain and frequency domain specifications?
(e) How the roots of characteristic equation are related to stability?
(f) What is the significance of integral controller and derivative controller in a PID controller?
(g) Why compensation is necessary for feedback control systems?

PART –II

Q. No.2 (a) Write the differential equations governing the mechanical systems shown in fig and determine the transfer function. (7)

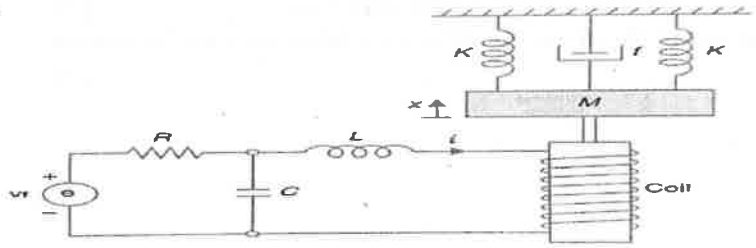


(b) Obtain the closed loop transfer function of the systems, by using Mason's gain formula.(7)

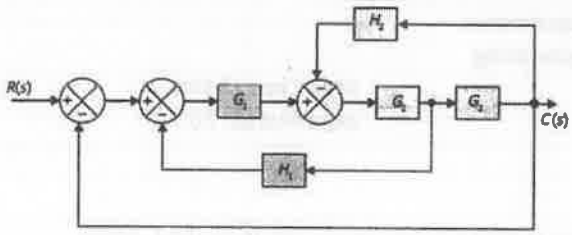


OR

Q. No.2 (a) Find the transfer function $X(s)/V_f(s)$ (9)



(b) Simplify the following diagram using block diagram reduction method; Also derive the transfer function of the same using signal flow graph. (5)



Q. No.3 (a) Derive time domain specification of a second order subjected to a step input. (8)
(b) A unity feedback control system has a is characterized by the $G(s) = \frac{Ks}{(s+1)^2}$. For the input r(t) =1+5t, Find the minimum value of K so that the steady state error is less than 0.1. (6)

OR

Q. No 3 (a) A feedback system employing output rate damping shown in figure 1.

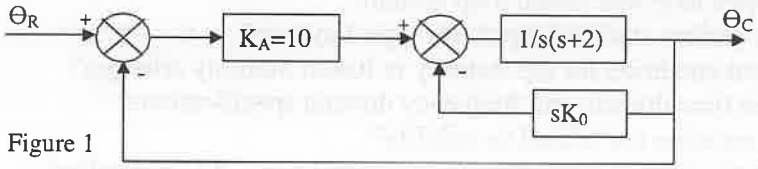


Figure 1

Determine the derivative feedback constant K0, which will increase the damping factor of the system to 0.6. What is the steady state error resulting from unit ramp input with this setting of the derivative feedback constant? (9)
(b) What are transient and steady state response of a control system? (5)

Q. No.4 (a) A unity fed back control systems $G(s) = \frac{K(s+3)}{(s+1)(S+6)}$. Draw the bode plot. (7)
(b) Consider that for the system with transfer function given below, draw the root locus and predict its stability. $G(s)H(s) = \frac{K}{s(s^2+2s+2)}$ (7)

OR

Q. No .4 (a) Draw the bode plot for $G(s) = \frac{(3s+1)}{(s+1)(4s+1)}$ (7)
(b) Sketch the root locus for $G(s) = \frac{K(s^2-4s+20)}{(s+2)(s+4)}$. Find the gain, K at the point where the locus crosses the imaginary axis. (7)

Q. No.5 (a) What is compensation and compensators? Analyze on Lead, Lag and Lag-Lead compensators with a neat diagram also explain their importance. (7)
(b) Explain the working of the DC servo motors and find transfer function of armature controlled servo motor. (7)

OR

Q. No.5 (a) What are the different types of controllers? What is the need for a controller? State and explain the effects of P ,PI and PID controller on the system dynamics. (7)
(b) Explain the working of AC servo motor. What are the difference between induction motor and AC Servo motor. (7)

Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes

Branch:Electrical Engineering
Course Code: BT EE 301A
Course Title:Electrical Circuit Analysis

Max Time: 3 hours
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) State duality and Dual Network.

(b) State Transfer function.

(c) What do you mean by Quality factor.

(d) Find the Laplace transform of unit step function and impulse function

(e) What do you mean by Convolution.

(f) An inductance of 8.0 mH is in series with two inductances in parallel, one of 3.0 mH and the other 6.0 mH. Find Leq.

(g) Define Transcondutance.

PART –II

Q. No.2

Obtain the Thévenin and Norton equivalents for the network shown in Fig.1

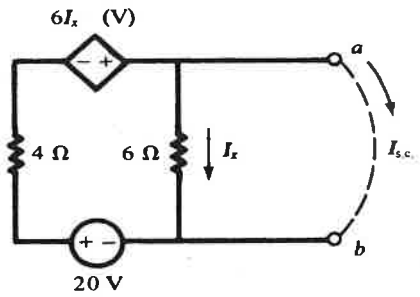


Fig. 1

OR

Q. No.2

Find the maximum power that the active network to the left of terminals ab can deliver to the adjustable resistor R in Fig. 2

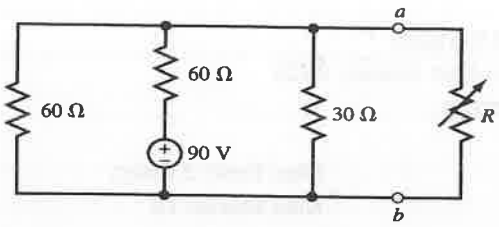


Fig. 2

Q. No.3 A 400 V, balanced three-phase supply is connected to a Y-connected load of 900 W at a power factor of 0.8 leading. Calculate the line current and the per phase load impedance.

OR

Q. No 3 Show by a phasor diagram that when three-phase balanced voltage sources are connected in delta formation, no current will flow round the loop so formed. Explain why delta-connected source is not used in practice.

Q. No.4

(a) Determine the Laplace transform of the waveform shown in Fig. 3

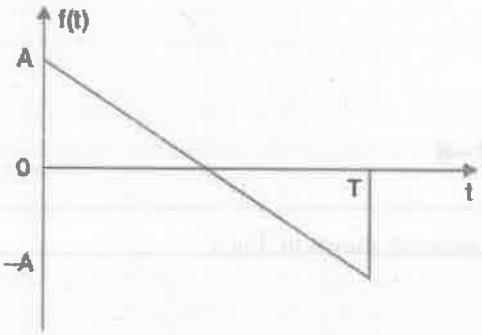


Fig. 3

(b) Draw the dual of the network in Fig. 4

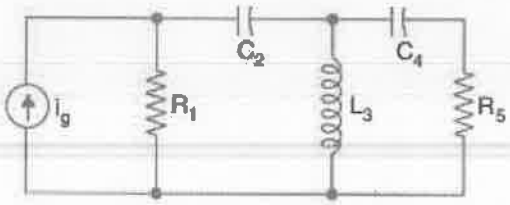


Fig. 4

OR

Q.No .4

(a) Derive the Laplace transform of the following functions:

(i) sinh *at*

(ii) 1 – exp (– *at*)

(b)The incidence matrix is given below as

Branches ⇒	1	2	3	4	5	6	7	8
A =	1	0	0	0	1	0	0	1
	0	1	0	0	−1	1	0	0
	0	0	1	0	0	−1	1	−1
	0	0	0	1	0	0	−1	0

Draw the oriented graph.

Q. No.5 . Determine the *Z, h-* and *Y*-parameters of the network shown in Fig.5

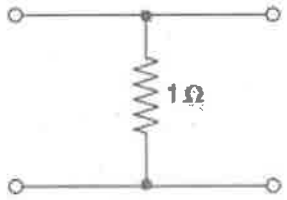


Fig. 5

OR

Q. No.5

(a) Show that when two two-port networks *N*1 and *N*2 are connected in parallel, the equivalent *Y*-parameter of the combined network is

$$Y_{equ} = Y_{N1} + Y_{N2}$$

(*b*) For the network shown in Fig.6 obtain the *Z*-parameters.

(c) Obtain the *h*-parameters of the network from the *Z*-parameters.

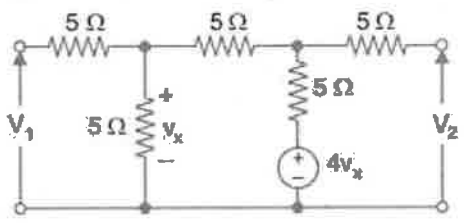


Fig. 6

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: All branch

Course Code: **BT EE306A** Max Time: 3hrs
Course Title: **MEASUREMENTS AND INSTRUMENTATION** Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carry two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Question No.1 Write short note on:

(a) The Wien's bridges is suitable for the measurement of frequency of the range of .....

(b) What is the mean by real, true and actual value in the network?

(c) Megger is a ..... type instrument.

(d) What is the power factor?

(e) The two watt meters used for the measurement of power input read 50 kW each. What will be the readings of the two watt meters if the power factor is changed to 0.8 leading keeping the total input power same?

(f) ..... Instruments measure the total quantity of electricity delivered at a particular time.

(g) What is the role of bridges in the network?

PART –II

Unit-I

Question No.2 (a) How many methods used in instrument to providing controlling torque? Explain in details. (7)

Question No.2 (b) With the help of diagram explain the Classification of Instruments. (7)

Or

Question No.2 (a) Explain the Generalized Instrument with the help of block diagram. (7)

Question No.2 (b) Define the following terms: (a) Accuracy (b) Precision (c) Resolution (d) Threshold (e) Sensitivity (7)

Unit-II

Question No.3 (a) What is the voltmeter? Explain its construction and working. (7)

Question No.3 (b) How to work the Moving iron type Instruments? Explain in dctails. (7)

Or

Question No.3 How to extend the range of the ammeter and voltmeter? Explain in detail.(14)

Unit-III

Question No.4 (a) Discuss different types of frequency meters used in practice? (7)

Question No.4 (b) Explain how three phase power factor meters gives indications which are independent of waveform shape and frequency? (7)

Or

Question No.4 (a) With the help of diagram explain the construction and working of watt meter. (7)

Question No.4 (b) Explain the energy meter with detail. (7)

Unit-IV

Question No.5 What is the method of Kelvin's double bridge follow to measurement the low resistance? Explain in detail. (14)

Or

Question No.5 Write the short note of

a. Wein's bridges (7)

b. Hays Bridge (7)

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code:BT EE505A/BT EE 508 **Max Time:3 Hrs**

Course Title: Electromagnetic Fields/ Electromagnetic Fields Theory

Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Explain the relationship between Cartesian and cylindrical as well as Cartesian and spherical coordinate systems?

(b) What are the various types of charge distributions, Explain with relevant expressions?

(c) Derive the relation between I and $\hat{J}$?

(d) Explain the capacitance and derive its basic expression.

(e) Write a short note on force on a differential current element.

(f) State and explain Faraday's law for induced e.m.f

(g) What are the standing waves? Define the node and antinode.

PART –II

Q. No.2 (a) State and explain Coulomb's Law (7M)

(b) A charge Q1 = -20μC is located at P(-6, 4, 6) and a charge Q2 = 50μC is located at R (5, 8, -2) in a free space. Find the force exerted on Q2 by Q1 in vector form. The distance given are in meters. (7M)

OR

Q. No.2 (a) Derive the expression for electric field due to infinite line charge. (10M)

(b) A uniform line charge, infinite in extent with ρ_L = 20nC/m lies along the Z axis. Find the $\hat{E}$ at (6, 8, 3)m. (4M)

Q. No.3 (a) Derive the integral form of continuity equation and also write its meaning? (7M)

(b) Obtain the equivalent equations for series and parallel connected capacitors? (7M)

OR

Q. No 3 Derive the expression for capacitance of (a) Co-axial cable, (b) Spherical capacitor (14M)

Q. No.4 (a) Obtain the inductance of a Solenoid and Toroid (10M)

(b) Calculate the inductance of a solenoid of 200 turns wound tightly on a cylindrical tube of 6 cm diameter. The length of the tube is 60cm and the solenoid isin air. (4M)

OR

Q. No .4 (a) Write down the Maxwell's equations in their general integral form. Derive the corresponding equations for fields varying harmonically with time (7M)

(b)Expalin the Faraday's disc generator and derive an expression for finding the un known magnetic field (7M)

Q. No.5 When a wave of frequency 10GHz is propagating in parallel conducting plane separated by 4CM. For TE1 mode. Determine (a) Cut off frequency, (b) Guide Wavelength, (c)Phase velocity and (d) Group Velocity. (14M)

OR

Q. No.5 (a) What are the various types of transmission lines? Give the circuit representation of parallel transmission line. (7M)

(b) Derive the expression to calculate attenuation factor for TE waves (7M)

Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE304A
Course Title: Electrical Machines 1

Max Time: 3 Hrs
Max Marks:70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define MMF, Reluctance and Inductance?

(b) Write a short note on single and double excited systems?

(c) Distinguish between LAP and WAVE winding?

(d) Define efficiency of dc machine and give its losses?

(e) Why transformer rating is expressed in terms of kVA?

(f) Define voltage regulation of a transformer

(g) List the advantages of three – phase transformer over three single – phase transformers.

PART –II

Q. No.2 (a) Write a short note on the the influence of highly permeable materials on the magnetic flux lines.

(b) With the help of graph, explain the B-H curve of the magnetic materials. (7+7)

OR

Q. No.2 (a) Derive the expression for energy stored in the magnetic circuits.

(b) Distinguish between linear and non linear magnetic circuits. (7+7)

Q. No.3 (a) Discuss in detail, the load characteristics of DC Series and Shunt generators.

(b) A 440 V, 4-pole, 25 kW, dc generator has a wave-connected armature winding with 846 conductors. The mean flux density in the air-gap under the interpoles is 0.5 Wb/m2 on full load and the radial gap length is 0.3 cm. Calculate the number of turns required on each interpole. (7+7)

OR

Q. No 3 (a) Explain the constructional features of DC generator in detail.

b) A 4-pole generator has a wave-wound armature with 722 conductors, and it delivers 100A on full load. If the brush lead is 80 calculate the armature demagnetizing and cross magnetizing ampere turns per pole. (7+7)

Q. No.4 (a) Explain the Brake test in a dc machine.

(b) A 200 V DC shunt motor with armature and field resistances of 0.25 ohm and 200 ohm respectively, takes a no load current of 5 A. If it takes 50 A under loaded conditions, find its efficiency as generator. (7+7)

OR

Q. No .4 (a) Explain about core and shell type of transformers and their relative merits with respect to other.

(b) Draw and explain the phasor diagram of single phase transformer on load considering with winding resistance. (7+7)

Q. No.5 (a) What is auto transformer? Explain the working principle of auto transformer.

(b) With the help of neat sketch, explain in detail about parallel operation of single phase transformers.

OR

Q. No.5 (a) Explain the concept of Scott connection (three phase to two phase) conversion with a neat circuit diagram.

(b) What is the significance of Y-Y, Y-delta and Delta-Y, Delta-Delta connections in 3-phase transformers?

CENTRAL UNIVERSITY OF HARYANA
III Semester Term End Examination, January 2023
B.Tech. Programme
Branch: Electrical Engineering

Course Code: **BT EE 307** **Max Time: 3 Hrs**

Course Title: **Transmission and Distribution** **Max Marks: 70**

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carry two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Question No.1

(a) Give Voltage levels of Primary Transmission and Secondary distribution.

(b) What are the functions of Current and Potential Transformers in a Substation?

(c) Define Line Capacitance and Line Inductance in Transmission lines.

(d) State the line lengths of Short, Medium and Long transmission lines.

(e)Define Sag and Stress in transmission lines.

(f) Define String Efficiency of suspension type insulators.

(g) Define Grading of Cables.

PART –II

Unit-I

Question No.2

Explain the Layout of Substation with diagrams. State the difference between Radial and Ring main distribution system.

Or

Question No.2

Explain the Advantages and Disadvantages of HVAC system. Draw the layout of different busbar schemes.

Unit-II

Question No.3

Explain Ferranti effect with phasor diagram. Explain Proximity Effect with diagram. Explain the benefits of using bundled conductors.

Or

Question No.3

Explain modelling of Short, medium and long transmission lines with diagram and derivations of voltage regulation for all the models.

Unit-III

Question No.4

Give the description of two types of mechanical vibrations in transmission lines and means to damp them. Explain with diagrams various kinds of Insulators.

Or

Question No.4

Explain with diagram and equations different methods for equilization of potential over insulator string.

Unit-IV

Question No.5

With diagrams explain the contruction of various types of Underground Cables. Give the advantages and disadvantages of underground cables when compared to Overhead Transmission lines.

Or

Question No.5

Explain Corona losses, critical voltage and methods to reduce corona. Explain Radio Interference because of power transmission.

Central University of Haryana
Odd Semester Term End Examination January 2023
B.Tech. Programmes

Branch: Electrical Engineering

Course Code: BT EE 506A **Max Time:** 3 Hrs
Course Title: Economics for Engineers **Max Marks:** 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 (2*7 = 14)

a) Define Sunk cost with example?
b) Define the term Quarterly Compounding?
c) Define the term Annuity?
d) Write an example of an Opportunity cost?
e) Define Consumer Price Index?
f) Define Uncertain Situation with example?
g) Define Internal rate of return method?

PART –II

Q. No.2 Differentiate between recurring and non-recurring costs with suitable examples and describe the Power size model of cost estimation with suitable examples? (14 marks)

OR

Q. No.2 Define Price elasticity of demand and describe all the types of price elasticity of demand with suitable examples? (14 marks)

Q. No.3 Define Cash flow statement and describe the sources of cash inflows, outflows and usefulness of cash flow statements? (14 marks)

OR

Q. No 3 Define Interest rate and explain the importance as well as techniques of estimating time value of money? (14 marks)

Q. No.4 Describe, in brief the importance of Sensitivity analysis with suitable example and estimate the break-even sales for ABC Ltd who has showed a profit of Rs 6,80,000 on a sale of Rs 35,00,000 and the variable expenses were Rs 25,00,000? (14 marks)

OR

Q. No .4 Consider the following two mutually exclusive alternatives.

	A	B
Cost	Rs 4,000	Rs 6,000
Uniform annual benefit	Rs 640	Rs 960
Useful life (years)	Rs 20	Rs 20

Using a 15% interest rate, determine which alternative should be selected based on the future worth method of comparison (F/P,i,n = 16.367; P/F,i,n = 0.0611; F/A,i,n = 102.444; A/F,i,n = 0.0098; P/A,i,n = 6.2593; A/P,i,n = 0.1598 and A/G,i,n = 5.3651)? (14 marks)

Q. No.5 Define inflations and list the causes of inflation? Describe the various forms in which firms can borrow funds from banks? (14 marks)

OR

Q. No.5 An automobile company recently advertised its car for a down payment of Rs 1,50,000. Alternatively, the car can be taken home by customers without making any payment, but they have to pay an equal yearly amount of Rs 25,000 for 15 years at an interest rate of 10%, compounded annually. You are asked to advise the best alternative for the customers based on the present worth method of comparison (F/P,i,n = 2.594; P/F,i,n = 0.3855; F/A,i,n = 15.937; A/F,i,n = 0.0627; P/A,i,n = 6.1446; A/P,i,n = 0.1627 and A/G,i,n = 3.7255)? (14 marks)

Central University of Haryana
ODD Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE523A
Course Title: Industrial Electrical System

Max Time: 3hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Explain the selection of cable?

b) Describe five LT wiring system component?

(c) Describe earthing of Commercial installation?

(d) Explain UPS and battery bank?

(e) Explain Inverse current characteristics and draw its symbol?

(f) What is switchgear?

(g) Explain difference between contactor and isolator?

PART –II

Q. No.2

Explain the working principle of protection components Fuse, MCB, MCCB and ELCB?

OR

Q. No.2

What is Tariff structure? Explain various type of Tariff structure?

Q. No.3

What are different type of residential and commercial wiring system? What are the general rules and guidelines for installation?

OR

Q. No 3

Explain the mechanism of electrical shock and state electrical safety practices?

Q. No.4

Explain power factor correction and related equipment in electrical power system?

OR

Q. No .4

Explain the sizing of DGs, UPS and battery bank and what are the selection criteria of UPS and battery bank?

Q. No.5

Explain the working and operation of CFL, LED and energy saving in Illumination system?

OR

Q. No.5

Explain the term candle power, lamp efficiency, specific consumption, glare, space to height ratio, waste light factor, depreciation factor?

Central University of Haryana
III-Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE302A — **Max Time: 3 h**
Course Title: Semiconductor Devices & Circuits — **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What is Tunneling?

(b) What are the two mechanisms of breakdown in a P-N junction. Define both methods

(c) A full wave rectifier has a peak output voltage of 25 volts at 50 Hz and feeds a resistive load of 1kΩ. The filter used is shunt capacitor one with C=20μF, Determine dc load current.

(d) In common emitter B.J.T. configuration the voltage drop across load resistance of 1 kΩ is 1.2 V. Determine the base current. Given that $\beta = 60$.

(e) Why is MOSFET called sometimes IGFET? What is the significant difference b/w the construction of an E-MOSFET and De-MOSFET?

(f) Define CMMR? A differential amplifier has differential mode gain of 100 and a common-mode gain of 0.01. Calculate its CMRR in db.

(g) What is the difference b/w a trainagular wave and a sawtooth wave?

PART –II

Q. No.2 Derive relation b/w α and β for a common base transistor configuration.

A transistoris connected in common emitter configuration. Collector supply voltage V_{CC} is 10 volts, load resistance R_L is 800 Ω, voltage drop across load resistance is 0.8 volt and current gain α=0.96. Determine collector-emitter voltage and base current.

OR

Q. No.2 How can a voltage be doubled using a P-N junction diode and capacitor? Draw a schematic diagram of a voltage doubler circuit and explain how its various types work with their output waveforms.

Q. No.3 Explain construction of depletion and enhancement type of N-channel MOSFETs and explain its operation with the help of (I_D - V_{DS}) and (I_D - V_{GS}) characteristics.

OR

Q. No 3 Explain the small signal equivalent ciruit of the common drain configuration of the MOSFET and derive its current & voltage gains and input & output impedances.

Q. No.4 Explain what do you understand by 'offset voltage' and 'offset current' of an operational amplifier. Discuss with a neat diagram the technique used for minimizing offset voltage and offset current in an inverting amplifier. Derive gain of the feedback inverting amplifier.

OR

Q. No .4 What are the properties of an ideal operational amplifier? Explain how it is used as (i) integrator and (ii) differentiator.

Q. No.5 Write short note on followings

(a) Zero-crossing detector

(b) Voltage Regulator

OR

Q. No.5 Write short note on followings

(a) Instrumentation Amplifier

(b) Hysteresis comparator

Central University of Haryana
VI Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BT EE 601A
Course Title: Power Systems II

Max Time: 3 Hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Why one bus is selected as slack bus.
(b) Write the polar form of the power flow equations.
(c) Write comparison between Gauss-Seidel and Newton-Raphson Method.
(d) Explain the ideal speed droop characteristics of a speed governor.
(e) What is the necessity to regulate voltage and frequency in the power system?
(f) What is the difference of ACE in single-area and two area power systems
(g) Summarize the common advantages of STATCOM?

PART –II

Q. No.2 (a) Explain clearly with a flow chart the computational procedure for load flow solution using Newton-Raphson method when the system contains all types of buses. (6)

(b) The load flow data for a three-bus system is given in tables. The voltage magnitude at bus 2 is to be maintained at 1.04 p.u. The maximum and minimum reactive power limits for bus 2 are 0.2 and 0.5 p.u. respectively. Taking bus 1 as the slack bus, determine the voltages of the various buses at the end of first iteration starting with a flat voltage profile for all buses except slack bus using Gauss-Seidel method with acceleration factors 1.5. (8)

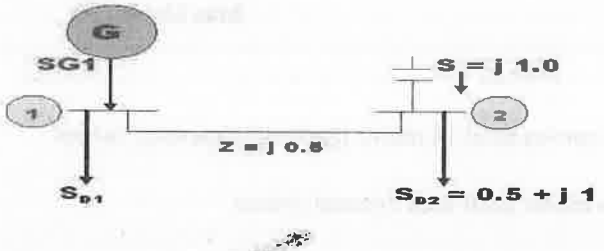
Bus code	*Impedance*	*Bus code*	*Line changing admittance* $\frac{y'_{pq}}{2}$
1–2	0.06 + *j*0.18	1	*j* 0.05
1–3	0.02 + *j*0.06	2	*j*0.06
2–3	0.04 + *j*0.12	3	*j*0.05

Bus code	*Assumed voltages*	*Generation*		*Load*	
		MW p.u.	*MV Ar* p.u.	*MW* p.u.	*MV Ar* p.u
1	1.06 + *j*0.0	0.0	0.0	0.0	0.00
2	1.0 + *j*0.0	0.2	0.0	0.0	0.00
3	1.0 + *j*0.0	0.0	0.0	0.6	0.25

OR

Q. No.2 (a) Develop the block diagram of an Automatic Generation Control system of an isolated power system. (8)

(b) Obtain the voltage at bus 2 for the simple system shown in Figure, using the Gauss-Seidel method, if V1 = 1+j0 pu. (6)



Q. No.3 (a) Derive model of a speed governing system and represent it by block diagram. (8)

(b) Two generators rated at 120MW and 250 MW are operating in parallel. The governor setting on the machines are such that have 4 percent and 3 percent drops. Determine (i) The load taken by each machine for a total load 200MW.(ii) The percentage no load speed and rated output of machine 1 to made by the speeder motor if machine are to share a load equally. (6)

OR

Q.No.3 (a) Develop the block diagram of an Automatic Generation Control system of an isolated power system. (8)

(b) Two generators rated 400MW and 700MW are operated in parallel. The droop characteristics of their governors are 3% and 4% respectively from no load to full load. Assuming that the governors are operating in 50Hz at no load, how would a load of 1000MW is shared between them? What will be the system frequency at this load? Assume linear governor operation. Determine the full load speed for each machine. (6)

Q. No.4 (a) Describe power system operating states with the help of a neat figure. (7)

(b) Discuss various components of SCADA with neat diagram. Also list some of the common features of SCADA. (7)

OR

Q. No .4 (a) What is voltage collapse? Explain the main factors that contribute the phenomena of voltage collapse. (7)

(b) Describe the working principle of the two types of Static Var Compensators SVC with neat schematic diagrams.. (7)

Q. No.5 (a) Describe structure of vertically integrated utility with the help of a neat figure. (7)

(b) Explain with neat diagram different entities involved in deregulation. (7)

OR

Q. No.5 (a) Describe structure of deregulated (restructured) power industry with the help of a neat figure. (7)

(b) Explain the method of price selection in Single sided and double sided linear bid market.(7)

Central University of Haryana
ODD Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE532A
Course Title: Power Plant Engineering

Max Time: 3hrs
Max. Marks:70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) State any four renewable sources of energy.

b) State any two disadvantages of thermal power plant.

(c) State any two types of condensers used in thermal power plants.

(d) List out advantages of disadvantages of Nuclear Power Station.

(e) What is super-heater?

(f) What is the use of cooling tower?

(g) State any two advantages of nuclear power station.

PART –II

Q. No.2

What is the working and Classifications of the boilers?

OR

Q. No.2

Describe Thermal Power Plant and Sketch the line diagram of the plant.

Q. No.3

What is Hydro plant. What are the classifications and how site is selected for it?

OR

Q. No 3

Describe about the specification and Characteristics of Hydro generator?

Q. No.4

What are the Principle of energy production by nuclear fission and Draw Schematic diagram of nuclear power plant?

OR

Q. No .4

Describe Different types of reactors and Problems of nuclear power plants.

Q. No.5

Differentiate between open cycle, closed cycle and combined cycle in Gas power plant?

OR

Q. No.5

Explain the working principle of Diesel power plant? Describe its component in brief with schematic diagram?

Central University of Haryana
III-Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Electrical Engineering

Course Code: BTEE302A — **Max Time: 3 h**
Course Title: Semiconductor Devices & Circuits — **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What is Tunneling?

(b) What are the two mechanisms of breakdown in a P-N junction. Define both methods

(c) A full wave rectifier has a peak output voltage of 25 volts at 50 Hz and feeds a resistive load of 1kΩ. The filter used is shunt capacitor one with C=20μF, Determine dc load current.

(d) In common emitter B.J.T. configuration the voltage drop across load resistance of 1 kΩ is 1.2 V. Determine the base current. Given that $\beta = 60$.

(e) Why is MOSFET called sometimes IGFET? What is the significant difference b/w the construction of an E-MOSFET and De-MOSFET?

(f) Define CMMR? A differential amplifier has differential mode gain of 100 and a common-mode gain of 0.01. Calculate its CMRR in db.

(g) What is the difference b/w a trainagular wave and a sawtooth wave?

PART –II

Q. No.2 Derive relation b/w α and β for a common base transistor configuration.
A transistoris connected in common emitter configuration. Collector supply voltage V_{CC} is 10 volts, load resistance R_L is 800 Ω, voltage drop across load resistance is 0.8 volt and current gain α=0.96. Determine collector-emitter voltage and base current.

OR

Q. No.2 How can a voltage be doubled using a P-N junction diode and capacitor? Draw a schematic diagram of a voltage doubler circuit and explain how its various types work with their output waveforms.

Q. No.3 Explain construction of depletion and enhancement type of N-channel MOSFETs and explain its operation with the help of (I_D - V_{DS}) and (I_D - V_{GS}) characteristics.

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Q. No 3 Explain the small signal equivalent ciruit of the common drain configuration of the MOSFET and derive its current & voltage gains and input & output impedances.

Q. No.4 Explain what do you understand by 'offset voltage' and 'offset current' of an operational amplifier. Discuss with a neat diagram the technique used for minimizing offset voltage and offset current in an inverting amplifier. Derive gain of the feedback inverting amplifier.

OR

Q. No .4 What are the properties of an ideal operational amplifier? Explain how it is used as (i) integrator and (ii) differentiator.

Q. No.5 Write short note on followings

(a) Zero-crossing detector
(b) Voltage Regulator

OR

Q. No.5 Write short note on followings

(a) Instrumentation Amplifier
(b) Hysteresis comparator

Central University of Haryana
3rd Semester End Term Examination (Regular) Jan 2023

Programme: B.Tech (Civil Engineering) **Semester:** 3rd
Course Code: BT CE 201 A **Max Time:** 3hrs
Course Title: Strength of Materials **Max Marks:** 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

a) A steel rod 1 m long and 20 mm x 20 mm in cross section is subjected to a tensile force of 40 kN. Determine the elongation of the rod, if the modulus of elasticity for the rod material is 200 GPa.
b) State clearly Hook's Law.
c) A Steel wire of 10 mm diameter is bent into a circular arc of 20 meter radius. Determine the maximum stress induced in it. Take $E=2x10^5$ N/mm^2
d) How will you find the strength of a solid shaft?
e) Explain the term slenderness ratio and describe with the mathematical expression, how it limits the use of Euler's formula for crippling load.
f) State Mohr's IST and IInd theorem.
g) Define Conjugate beam and give the relation between actual beam and conjugate beam.

PART –II

Q. No.2

a) Discuss the stress-strain diagram for ductile and brittle material in detail.
b) The stresses at point of a machine component are 150 MPa and 50 Mpa both tensile in nature. Find the intensities of normal, shear and resultant stresses on a plane inclined at an angle of 55° with the axis of major tensile stress. Also find the magnitude of the maximum shear stress in the component.
c) A simply supported beam 6 m long is carrying a uniformly distributed load of 5kN/m over a length of 3 m from the right end. Draw the shear force and bending moment diagram for the beam and also calculate the maximum bending moment of the section.

Q. No.3

a) Define the term bending stress and prove the Prove the Relation,

$$\frac{M}{I}=\frac{\sigma}{y}=\frac{E}{R}$$

Where M is bending moment, I is moment of Inertia of the section, σ is bending stress, E is Young's Modulus of Elasticity, R is radius of Curvature.
b) A rectangular beam 60 mm wide and 150 mm deep is simply supported over a span of 6 m. If the beam is subjected to central point load of 12 kN, find the maximum bending stress induced in the beam section.
c) A 300 mm x 150 mm I-girder has 12 mm thick flange and 8 mm thick web. It is subjected to shear force of 150 kN at a particular section. Find the ratio of maximum shear stress to minimum shear stress in the web. What is the maximum shear stress in the flange?

Q. No.4

a) Explain the term Torque and Polar modulus. Also find the maximum torque, that can be safely applied to a shaft of 80 mm diameter. The permissibe ange of twist is 1.5 degree in a length of 5 m and shear stress not to exceed 42 MPa. Take C = 84 GPa

b) A hollow steel shaft of 300 mm external diameter and 200 mm internal diameter has to be replaced by a solid alloy shaft. Assuming the same values of polar modulus for both, calculate the diameter of the solid alloy shaft and work out the ratio of their torsional rigidities. Take C (Modulus of Rigidity) for steel as 2.4 C for alloy.

c) A hollow alloy tube 4 m long with external and internal diameter of 40 mm and 25 mm respectively was found to extend 4.8 mm under a tensile load of 60 kN. Find the buckling load for the tube with both ends pinned. Also find the safe load on the tube, taking factor of safety as 5.

Q. No.5

a) State the relationship between slope, deflection and radius of curvature of a simply supported beam. Also find the expression for slope of a beam at the support A and deflection of the beam at its centre if a simply supported beam AB of span L and stiffness EI carries a concentrated load P at its centre.

b) With the help of moment are method find the deflection of the cantilever beam at its free end if a cantilever beam of span 2.8 m is subjected to gradually varying load from zero at the free end to 20 kN/m over fixed end. Take EI for the cantilever beam as 8 x 10^{12} N-mm^2

c) A beam ACB of length L, simply supported at the ends has moment of inertia 4I for the length AC and I for the length CB and is loaded with point load W at C. Using Conjugate beam method determine i) slope at end A and ii) deflection at mid span. Also compute the numerical values taking W= 8kN, length of CB portion is 2.5 m and total length (L) of beam ACB is 12.5 m, I = 5000cm^4 and E = 2x 10^5 N/mm^2

Central University of Haryana
Third Semester Term End Examination Jan. 2023
B.Tech. Programme
Branch: Civil Engineering

Course Code:	BT CE 207A	**Max Time: 3h**
Course Title:	Building Construction and Materials	**Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks where each part of question carry seven marks. Students are required to attempt any two parts out of three choices for fourteen marks.

PART -I

Q. No.1

(a) Define the function of frog in bricks.
(b) Draw the structure of a timber.
(c) Define the dressing of stones.
(d) Define stone masonry work.
(e) Draw a diagram of combined footing.
(f) Define cavity wall construction.
(g) Define Caisson foundation.

PART –II

Q. No.2: Enlist the field tests for bricks. Write the classification of bricks as per IS 1077.

OR

Q. No.2: Define Rocks. Write and explain the different types of rocks.

OR

Q. No.2: Explain the seasoning of timber and its different methods.

Q. No.3: write and explain three different grades of cement. Write the chemical composition of Portland cement.

OR

Q. No 3: Differentiate between Fe-250 (mild steel), Fe-415 and Fe-500 and draw the stress strain behaviour of three grades of steel.

OR

Q. No 3: Write in detail the Aggregate Impact Value (AIV) test.

Q. No.4: Define the significance of wall ties in cavity wall construction. Write the advantages of cavity wall construction over conventional brick masonry wall.

OR

Q. No .4: Define brick masonry and explain different types of laying tools.

OR

Q. No .4: Enlist the different modern equipment used in building construction. Explain any five in detail.

Q. No.5: Differentiate between shallow and deep foundation. Enlist the different types of deep foundations and explain skin-friction piles in detail.

OR

Q. No.5: Define DPC and its physical significance. Draw retaining wall with DPC.

OR

Q. No.5: Define the components of stair-case in detail with the help of diagram.

Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BTCE 205A — **Max Time: 3 hours**
Course Title: Fluid Mechanics I — **Max Marks:** 70

Instructions:
Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers in (PART-II) contains questions from 2(two) to 5(five). And each question carries fourteen marks each with internal choice.

PART -I

1(a) Derive an equation for pressure intensity inside a soap bubble.

1(b) Prove that streamline and equipotential lines cut orthogonally each other.

1 (c) Find the pressure represented by a column of

(a) 10 cm of water
(b) 2 cm of mercury

1(d) Write down equation of total pressure around curved surface.

1(e) In which condition, cavitation will occur in the venturimeter?

1(f) Why Cipolletti weir is used for the discharge measurement?

1(g) What are the methods to be used for controlling the separation of boundary layer?

PART -II

Q2(a) A sleeve 10 cm long encases a vertical metal rod 3.0 cm in diameter with a radial clearance of 0.02 mm. If when immersed in an oil of viscosity 6.0 poise, the effective weight of the sleeve is 7.5 N, will the sleeve slide down the rod and if so at what velocity.

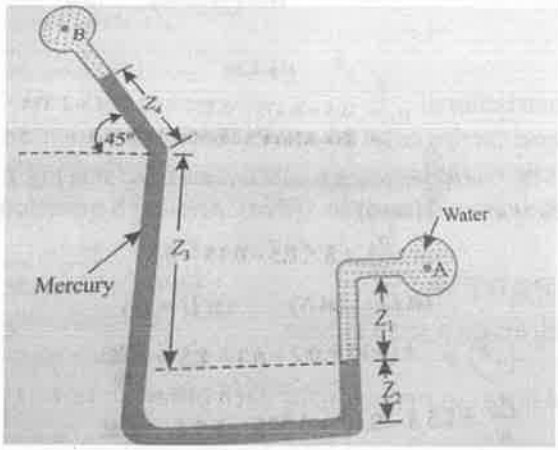
Q2(b) A U tube is made up of two capillaries of bores 1.2 mm and 2.4 mm respectively. The tube is held vertical and partially filled with the liquid of surface tension 0.06 N/m and zero contact angle. If the estimated difference in the level of two menisci is 15 mm determine the mass density of the liquid.

or

Q2(a) A velocity potential for a two-dimensional flow is given by $\phi = (x^2 - y^2) + 3xy$. Calculate (i) the stream function and (ii) the flow rate between the streamlines through points (1,1) and (1,2).

Q2(b) Derive a Continuity equation for a three-dimensional flow for an incompressible flow, steady and irrotational flow.

Q3(a) Find the pressure difference in between A and B. Take $Z_1 = 0.45$ m, $Z_2 = 0.225$ m, $Z_3 = 0.675$ and $Z_4 = 0.3$ m.



Q3(b) An isosceles triangular plate of base width 2.0 m and height 2.0 m is submerged in a liquid of relative density of 0.82 in such a way that its plane makes an angle of 30 degree with the liquid surface. The base of the plate is horizontal and is nearer to the liquid surface than the apex of the plate. If the depth of base of plate is 1.5 m, calculate the total force on one side of the plate and the position of center of pressure.

or

Q3(a) Derive an equation for the metacentric height.

Q3(b) A cone of specific gravity S is flowing in water with its apex downwards. It has a Radius R and vertical height H. Show that for stable equilibrium of cone.

$$H = \left(\frac{R^2 S^{1/3}}{1 - S^{1/3}}\right)^{1/2}$$

Q4(a) An orifice meter with orifice diameter 15cm is inserted in pipe of 30cm diameter. The pressure difference measured by mercury oil differential manometer on the two sides of the orifice meter gives a reading of 50 cm of mercury. Find the rate of flow of oil specific gravity 0.9 when the coefficient of discharge of the meter=0.64.

Q4(b) Show that velocity of flow through an orifice is given by

$$V = \sqrt{2gH}\, f\left(\frac{D}{H}, \frac{\mu}{\rho V H}, \frac{\sigma}{\rho V^2 H}\right)$$

Where H = head causing the flow, D = diameter of orifice, μ = Coefficient of viscosity, P = density, σ = Surface tension and g = acceleration due to gravity.

or

Q4(a) A rectangular contracted weir has a length of 2.5m between the abutments. There are two 0.15m thick rectangular pier-like obstructions on the crest. Estimate the discharge under a head of 0.70m. Assume C_d = 0.62 and the velocity of approach to be negligible.

Q4(b) Water discharges at the rate of 98.2 X 10^{-3} m3/sec through a 0.12 m diameter vertical sharp edged orifice placed under a constant head of 10 m. A point on the jet measured from the vena contracta has coordinates 4.5 m horizontal and 0.54 m vertical. Find Cc, Cv and Cd of orifice.

Q5(a) A kite 0.8 m x 0.8 m weighing 4 N assumes as angle of 12 degree to the horizontal. The string attached to the kite makes an angle of 45 degree to the horizontal. The pull on the string is 25 N when the wind is blowing at a speed of 30 km/hr. Find the coefficents of lift and drag?

Q5(b) Discuss drag force around a sphere with the help of neat sketch.

or

Q5(a) How will you determine weather a boundary layer flow is attached flow, detached flow or on the verge of separation of flow.

Q5(b) A plate 450 mmx150mm has been placed longitudinally in a stream of crude oil(specific gravity 0.925 and kinematic viscosity of 0.9 stoke) which flows with velocity of 6 m/s. Calculate:

(i) The friction drag on the plate

(ii) Thickness of the boundary layer at the trailing edge and

(iii) Shear stress at the trailing edge

Central University of Haryana
VI Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 604A — **Max Time: 3 hrs**
Course Title: Environmental Engineering-II — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Population Equivalent
(b) Relative Stability
(c) Grit Chambers
(d) Detritus Tanks
(e) F/M Ratio
(f) Sludge Volume Index
(g) Dry Weather Flow

PART –II

Q. No.2 (a) A 350 mm dia sewer is to flow at 0.35 depth on a grade ensuring a degree of self-cleansing equivalent to that obtained at full depth at a velocity of 0.8m/sec. Find:
(i) the required grade (ii) associated velocity (iii) the rate of discharge at this depth
Given: Manning's rugosity coefficient = 0.014
Proportionate area = 0.315
Proportionate wetted perimeter = 0.472
Proportionate HMD (r/R) = 0.7705
(b) Explain different shapes of sewer pipes and forces acting on sewer pipes with a neat sketch.
OR
Q. No.2(a) Explain physical and chemical characteristics of sewage..
(b) A population of 30,000 is residing in a town having an area of 60 hectares. If the sewerage coefficient of runoff for this area is 0.60, and the time of concentration of design rain is 30 minutes, calculate the discharge for which the sewers of a proposed combined system will be designed for the town in question. Make suitable assumptions where needed.

Q. No.3(a) Explain different types of screens used in screening process. Draw a flow diagram of treatment plant which may be used for very small towns.
(b) Estimate the screen requirement for a plant treating a peak flow of 60 million litres per day of sewage.
OR
Q. No 3(a) Explain different types of sedimentation tanks with neat sketches.
(b) Explain merits and demerits of trickling filters. Determine the size of a high rate trickling filter for the following data:
(i) Sewage flow = 4.5 Mld
(ii) Recirculation ratio =1.5
(iii) BOD of raw sewage = 250 mg/l
(iv) BOD removal in primary tank = 30%
(v) Final effluent BOD desired = 30 mg/l

Q. No.4(a) What do you mean by activated sludge process? Explain methods of aeration. Draw a flow diagram for a conventional ASP giving high degree of treatment.
(b) Explain the methods of distribution system with neat sketches.
OR
Q. No .4(a) Explain thickening of sludge. Draw a neat sketch of gravity sludge thickener.
(b) Design a conventional activated sludge plant to treat domestic sewage with diffused air aeration system, given the following data:
Population = 35,000
Average sewage flow = 180 lpcd
BOD of sewage = 220 mg/l
BOD removed in primary treatment = 30%
Overall BOD reduction required = 85%

Q. No.5(a) What are oxidation ponds and stabilisation ponds? Explain with neat sketches. Also, discuss the design criteria to be adopted for the same.
(b) What are centrifugal and reciprocating pumps? Explain with neat sketches.
OR
Q. No.5(a) Design an oxidation pond for treating sewage from a hot climatic residential colony with 5000 persons, contributing @ 120 litres per capita per day. The 5-day BOD of sewage is 300 mg/l.
(b) Explain septic tank with a neat sketch. What are the design considerations for septic tank? Discuss.

Central University of Haryana
Semester Term End Examination January 2023
B.Tech. (Civil Engineering)

Course Code: BTCE 603A **Max Time:** 3 Hours
Course Title: Design of Steel Structures **Max Marks:** 70

Instructions:
Question Number one **(PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers **(PART-II)** 2 (two) to 5(five) carry fourteen marks each with internal choice.
Note: IS 800:2007 is allowed to use in the exam.

PART -I

Q. No.1

(a) Explain the term: i) Characteristic Action ii) Design Action
(b) Distinguish between Factor of safety and Partially safety factor
(c) Distinguish between laterally restrained and unrestrained beams
(d) Write short note on block shear failure.
(e) Explain the different modes of failure of tension members.
(f) What is the difference between long column and short column?
(g) What is plate girder? Explain its various components with sketches

PART –II

Q. No.2 Design a singly bolted cover butt joint to connect boiler of thickness 12 mm for maximum efficiency. Use M16 bolts of grade 4.6. Boiler plates are of Fe 410 grade. Find the efficiency of the joint.

OR

Q. No.2 A tie member consists of two ISMC 250. The channels are connected on either side of a 12 mm thick gusset plate. Design the welded joint to develop the full strength of the tie. However, the overlap is to be limited to 500 mm.

Q. No.3 Design a double angle tension member connected on each side of a 10 mm thick gusset plate, to carry an axial factored load of 375 kN. Use 20 mm black blots. Assume shop connections.

OR

Q. No.3 Design a simply supported beam of effective span 1.5 m carrying a factored concentrated load of 360 kN at mid span.

Q. No.4 Design a laced column with two channels back to back of length 10 m to carry an axial factored load of 1400 kN. The column may be assumed to be hinged at both ends.

OR

Q. No.4 Design a gusseted base for a column ISHB350 @ 710 N/m with two plates 450 mm × 20 mm carrying a factored load of 3600 kN. The column is to be supported on concrete pedestal to be built with M20 concrete.

Q. No.5 Design a simply supported gantry girder to carry an electric overhead travelling crane, given:

- Span of gantry girder = 6.5 m
- Span of crane girder = 16 m
- Crane capacity = 250 kN
- Self weight of crane girder excluding trolley = 200kN
- Self weight of trolley = 50kN
- Minimum hook approach = 1.0 m
- Distance between wheels = 3.5 m
- Self-weight of rails = 0.3 kN/m

OR

Q. No.5 Design a welded plate girder of span 24 m to carry superimposed load of 35kN/m. Use Fe 415 (E250) steel.

CENTRAL UNIVERSITY OF HARYANA

Term End Examinations January 2023

Programme: B.Tech. CSE **Session: 2022-23**

Semester: Sixth **Max. Time: 3 Hours**

Course Title: Data Warehousing and Data Mining **Max. Marks: 70**

Course Code: BT CS 604 A

Instructions:

1. Question no. 1 has seven parts and students are required to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student are required to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) How is data warehouse differ from DBMS?

b) What is Associative Classification.

c) What are the objective of Clustering

d) How effective are Bayesian Classification.

e) Compare and Contrast between OLTP&OLAP

f) Design Fact constellation table with suitable example

g) support vector machine

Q 2. (2X7=14)

a) Describe the various phases in knowledge discovery process with a neat diagram.

b) What is Association Analysis. Explain Association rule, Support & Confidence.

c) State the Principle of Apriori Algorithm

Q 3. (2X7=14)

a) How to represent frequent itemset in compact format?

b) Data Cube measures operation with example. Explain the categories of measures.

c) What is cluster analysis. Describe the different types of cluster techniques with example.

Q 4. (2X7=14)

a) Explain how decision tree induction algorithm works with example. Listand explain the different characteristics of decision tree induction with example.

b) What are the key issues in hierarchical clustering? Explain.

c) Why naive Bayesian Classification called naive. Briefly outline the major ideas of naive Bayesian Classification. Explain Naive Bayes Classification.

Q5. (2X7=14)

a) Explain the strategies used in frequent item set generation.

b) What is Data Warehouse? Explain three tier architecture of data warehouse

c) Explain Data Mining Techniques issues with its applications.

Central University of Haryana
Term End Examination January 2023
B.Tech. Programme
Branch: Civil Engineering

Course Code:	BT CE 207A	**Max Time: 3h**
Course Title:	Building Construction and Materials	**Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks where each part of question carry seven marks. Students are required to attempt any two parts out of three choices for fourteen marks.

PART -I

Q. No.1

(a) Define the function of frog in bricks.

(b) Draw the structure of a timber.

(c) Define the dressing of stones.

(d) Define stone masonry work.

(e) Draw a diagram of combined footing.

(f) Define cavity wall construction.

(g) Define Caisson foundation.

PART –II

Q. No.2: Enlist the field tests for bricks. Write the classification of bricks as per IS 1077.

OR

Q. No.2: Define Rocks. Write and explain the different types of rocks.

OR

Q. No.2: Explain the seasoning of timber and its different methods.

Q. No.3: write and explain three different grades of cement. Write the chemical composition of Portland cement.

OR

Q. No 3: Differentiate between Fe-250 (mild steel), Fe-415 and Fe-500 and draw the stress strain behaviour of three grades of steel.

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OR

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OR

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Q. No.5: Differentiate between shallow and deep foundation. Enlist the different types of deep foundations and explain skin-friction piles in detail.

OR

Q. No.5: Define DPC and its physical significance. Draw retaining wall with DPC.

OR

Q. No.5: Define the components of stair-case in detail with the help of diagram.

Central University of Haryana
III Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BTCE 205A **Max Time: 3 hours**
Course Title: Fluid Mechanics I **Max Marks:** 70

Instructions:
Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers in (PART-II) contains questions from 2(two) to 5(five). And each question carries fourteen marks each with internal choice.

PART -I

1(a) Derive an equation for pressure intensity inside a soap bubble.

1(b) Prove that streamline and equipotential lines cut orthogonally each other.

1 (c) Find the pressure represented by a column of

(a) 10 cm of water
(b) 2 cm of mercury

1(d) Write down equation of total pressure around curved surface.

1(e) In which condition, cavitation will occur in the venturimeter?

1(f) Why Cipolletti weir is used for the discharge measurement?

1(g) What are the methods to be used for controlling the separation of boundary layer?

PART -II

Q2(a) A sleeve 10 cm long encases a vertical metal rod 3.0 cm in diameter with a radial clearance of 0.02 mm. If when immersed in an oil of viscosity 6.0 poise, the effective weight of the sleeve is 7.5 N, will the sleeve slide down the rod and if so at what velocity.

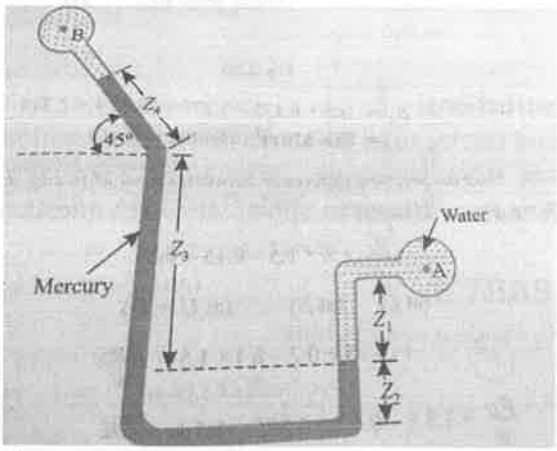
Q2(b) A U tube is made up of two capillaries of bores 1.2 mm and 2.4 mm respectively. The tube is held vertical and partially filled with the liquid of surface tension 0.06 N/m and zero contact angle. If the estimated difference in the level of two menisci is 15 mm determine the mass density of the liquid.

or

Q2(a) A velocity potential for a two-dimensional flow is given by $\phi = (x^2 - y^2) + 3xy$. Calculate (i) the stream function and (ii) the flow rate between the streamlines through points (1,1) and (1,2).

Q2(b) Derive a Continuity equation for a three-dimensional flow for an incompressible flow, steady and irrotational flow.

Q3(a) Find the pressure difference in between A and B. Take $Z_1 = 0.45$ m, $Z_2 = 0.225$ m, $Z_3 = 0.675$ and $Z_4 = 0.3$ m.



Q3(b) An isosceles triangular plate of base width 2.0 m and height 2.0 m is submerged in a liquid of relative density of 0.82 in such a way that its plane makes an angle of 30 degree with the liquid surface. The base of the plate is horizontal and is nearer to the liquid surface than the apex of the plate. If the depth of base of plate is 1.5 m, calculate the total force on one side of the plate and the position of center of pressure.

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Q3(a) Derive an equation for the metacentric height.

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$$H = \left(\frac{R^2 S^{1/3}}{1 - S^{1/3}}\right)^{1/2}$$

Q4(a) An orifice meter with orifice diameter 15cm is inserted in pipe of 30cm diameter. The pressure difference measured by mercury oil differential manometer on the two sides of the orifice meter gives a reading of 50 cm of mercury. Find the rate of flow of oil specific gravity 0.9 when the coefficient of discharge of the meter=0.64.

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$$V = \sqrt{2gH}\, f\left(\frac{D}{H}, \frac{\mu}{\rho V H}, \frac{\sigma}{\rho V^2 H}\right)$$

Where H = head causing the flow, D = diameter of orifice, μ = Coefficient of viscosity, P = density, σ = Surface tension and g = acceleration due to gravity.

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Q4(a) A rectangular contracted weir has a length of 2.5m between the abutments. There are two 0.15m thick rectangular pier-like obstructions on the crest. Estimate the discharge under a head of 0.70m. Assume C_d = 0.62 and the velocity of approach to be negligible.

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Q5(b) Discuss drag force around a sphere with the help of neat sketch.

or

Q5(a) How will you determine weather a boundary layer flow is attached flow, detached flow or on the verge of separation of flow.

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(i) The friction drag on the plate

(ii) Thickness of the boundary layer at the trailing edge and

(iii) Shear stress at the trailing edge

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: CIVIL ENGINEERING

Course Code: BT CE 307 A
Course Title: Construction Technology and Management

Max Time: 03 Hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART - I

Q1. Answer the following chronologically: (2 X 7 = 14)

(a) Enlist and briefly discuss different phases of a construction project.
(b) With the help of a flowchart identify different stages under pre-tender project planning.
(c) Write a short note on Dummy Activity.
(d) Briefly discuss the time estimates associated with an activity in PERT.
(e) List down major causes for accidents at construction sites.
(f) Explain the concept of Earned Value Analysis.
(g) Enlist and briefly discuss steps involved in updating construction plans.

PART - II

Q2. (a) What do you understand by Work break down? Explain the benefits of work breakdown structure with the help of a suitable example. (2 X 7) = 14 Marks
(b) With the help of suitable example bring out the differences between conventional and mechanized construction methods.

OR

(i) Differentiate between PERT and CPM techniques on the basis of time estimating approach. Further comment upon the accuracy of these two techniques.
(ii) List down various effects due to Inadequate Quality Control in a construction. Also suggest remedial measures for these effects.

Q3. (a) Discuss the utility of Building Information Modelling (BIM) in project management. (2 X 7) = 14 Marks
(b) A project consists of 8 activities A, B, C, D, E, F, G & H with their time of completion as follows:

Activity	A	B	C	D	E	F	G	H
Duration (weeks)	2	4	2	4	6	4	5	4

The precedence relationships are as follows:

A and B can be performed in parallel

C and D cannot start until A is complete

E cannot start until half the work of activity C is complete

F can only start after activity D is complete

G succeeds C

H is the last activity which should succeed E

Draw the bar-chart and find out total time for completion of project.

Also determine the increase in total time for completion of project if activity A takes 2 more weeks for completion.

OR

(i) Discuss the importance of supervision, record keeping and progress reports in context of project monitoring.

(ii) Determine the critical path for the network shown in Figure 1 using PERT. Numbers indicate time in weeks.

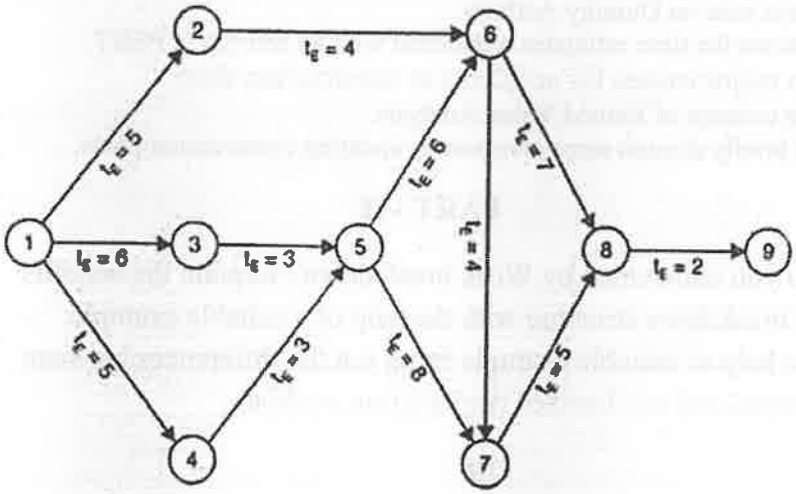


Figure 1: Network diagram for Q3 (ii)

Q4. (a) Discuss the importance of documentation at construction site. Further enlist and briefly discuss various documents used at construction site. (2 X 7) = 14 Marks

(b) What is a Construction Contract? Discuss the importance of specifications from contract point of view.

OR

Figure 2 shows the network for a construction project with the three time estimates for each activity. Determine:

(i) Critical Path and its standard deviation

(ii) Probability of completion of project in 40 days

(iii) Time duration that will provide 95% probability of completion of the project in time.

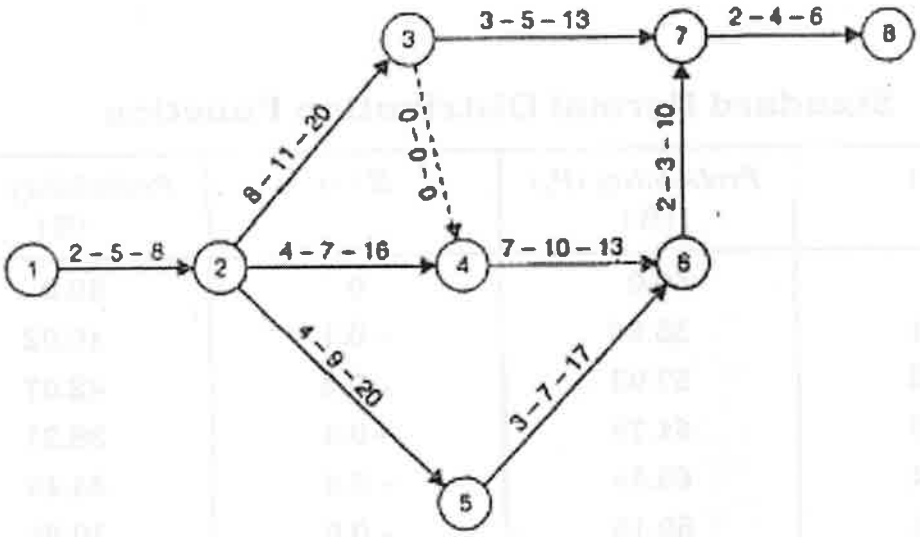


Figure 2: Network diagram for Q4

Q5. Enlist and discuss various construction equipment used for earthmoving, excavating, dewatering, transportation, concrete manufacturing, hoisting and material transportation at site. 14 Marks

OR

The network for a certain project is shown in Figure 3 along with the estimated time of completion of each activity marked. Compute the activity times, and total float, free float and independent float for each activity. Locate the critical path for this network.

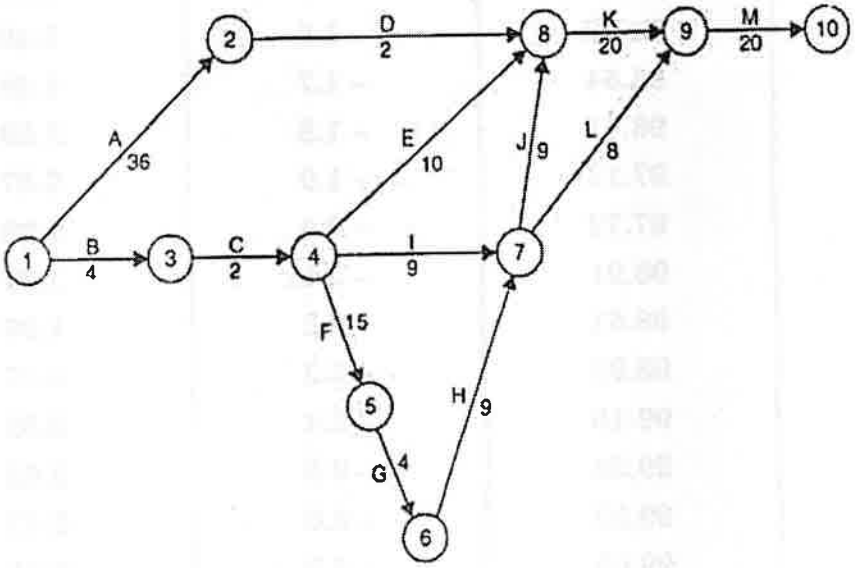


Figure 3: Network diagram for Q5

Standard Normal Distribution Function

$Z(+)$	Probability (P_r) (%)	$Z(-)$	Probability (P_r) (%)
0	50.0	0	50.0
+ 0.1	53.98	- 0.1	46.02
+ 0.2	57.93	- 0.2	42.07
+ 0.3	61.79	- 0.3	38.21
+ 0.4	65.54	- 0.4	34.46
+ 0.5	69.15	- 0.5	30.85
+ 0.6	72.57	- 0.6	27.43
+ 0.7	75.80	- 0.7	24.20
+ 0.8	78.81	- 0.8	21.19
+ 0.9	81.59	- 0.9	18.41
+ 1.0	84.13	- 1.0	15.87
+ 1.1	86.43	- 1.1	13.57
+ 1.2	88.49	- 1.2	11.51
+ 1.3	90.32	- 1.3	9.68
+ 1.4	91.92	- 1.4	8.08
+ 1.5	93.32	- 1.5	6.68
+ 1.6	94.52	- 1.6	5.48
+ 1.7	95.54	- 1.7	4.46
+ 1.8	96.41	- 1.8	3.59
+ 1.9	97.13	- 1.9	2.87
+ 2.0	97.72	- 2.0	2.28
+ 2.1	98.21	- 2.1	1.79
+ 2.2	98.61	- 2.2	1.39
+ 2.3	98.93	- 2.3	1.07
+ 2.4	99.18	- 2.4	0.82
+ 2.5	99.38	- 2.5	0.62
+ 2.6	99.53	- 2.6	0.47
+ 2.7	99.65	- 2.7	0.35
+ 2.8	99.74	- 2.8	0.26
+ 2.9	99.81	- 2.9	0.19
+ 3.0	99.87	- 3.0	0.13

Central University of Haryana
VI Sem Re-Appear Term End Examination Jan 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 605A — Max Time: 3 hrs
Course Title: Foundation Engineering — Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1
(a) Briefly discuss various types of soil samplers for obtaining soil samples.
(b) What are different types of earth pressure? Give examples.
(c) Draw contact pressure distribution diagram for rigid footing in clay and sand.
(d) What is Taylor's stability number? Discuss its utility for the determination of stability of finite slopes.
(e) Write short note on lime stabilization of soil.
(f) What is 'negative skin friction' on pile and why does it cause concern?
(g) Differentiate between net safe bearing capacity and gross safe bearing capacity.

PART –II

Q. No.2

(a) What do you understand by soil exploration? What are the different purposes for which the soil exploration is done? Discuss various methods of soil exploration. (7)

(b) A retaining wall with smooth vertical back is 10 m high and retains a two layer sand backfill with the following properties:

0-5 m depth: $c' = 0$, $\phi' = 30^o$ and $\gamma = 18$ kN/m^3

Below 5 m : $c' = 0$, $\phi' = 34^o$ and $\gamma = 20$ kN/m^3

Show the active earth pressure distribution and calculate resultant thrust and its line of action, assuming the water table to be well below the base of the wall. (7)

OR

Q. No.2

(a) Describe, in brief, various geophysical methods. Discuss their limitations and uses. (8)

(b) A retaining wall with vertical back, 8 m high, supports a sand soil with $c' = 0$ and $\phi' = 34^o$. Neglecting the wall friction, calculate the total active thrust on the wall if (i) the water table is below the base of the wall ($\gamma = 16$ kN/m^3),(ii) water table rises upto ground surface ($\gamma_{sat} = 20.5$ kN/m^3). (6)

Q. No.3

(a) How a slope is analysed using method of slices? Derive an expression for the factor of safety. (7)

(b) A 2 m wide strip footing is formed at a depth of 1.5 m below the ground level in a homogenous bed of dense sand having following properties: $\phi = 36^\circ$ and $\gamma = 1.85$ t/m^3. Determine the ultimate, net ultimate and net safe bearing capacity. Given for $\phi = 36^\circ$, $N_C = 60$, $N_q = 42$ and $N_\gamma = 47$. Assume a F.O.S. of 3. (7)

OR

Q. No 3

(a) Write short notes on :

(i) Plate load test

(ii) Punching shear failure (8)

(b) A granular soil has $\gamma_{sat} = 19$ kN/m^3, $\phi' = 35^\circ$. A slope has to be made of this material. If a factor of safety of 1.3 is needed against slope failure, determine the safe angle of the slope (i) when the slope is dry,(ii) if seepage occurs parallel to the surface of the slope. (6)

Q. No.4

(a) A group of nine piles, 12 m long and 250 mm in diameter is to be arranged in a square form in a clay soil with an average unconfined compressive strength of 60 kN/m^2. Work out centre to centre spacing of the piles for a group efficiency factor of 1.Neglect bearing at the tip of the piles and assume adhesion factor to be 0.9. (7)

(b) What is well foundation? Explain various components of well foundation with neat diagram. (7)

OR

Q. No .4

(a) Write short notes on:

(i) Classification of piles

(ii) Rectification of tilt and shift (8)

(b) Explain how single pile load capacity in compression is determined in cohesive and cohesionless soils? (6)

Q. No.5

(a) What do you understand by dewatering of soil? Explain Vacuum method of dewatering of soil with neat diagram. (7)

(b) What do you understand by ground improvement? Why is it required? Discuss various methods of ground improvement. (7)

OR

Q. No.5

Write short notes on:

(i) Application of geotextiles
(ii) Function of geotextiles
(iii) Shallow well system
(iv) Protective filters (14)

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: CIVIL ENGINEERING

Course Code: BT CE 311 A
Course Title: Transportation Engineering - II

Max Time: 03 Hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART - I

Q1. Write short notes on the following: (7 X 2 = 14)

(a) Rail Fastenings
(b) Cant Deficiency
(c) Signalling Systems
(d) Landing Aids
(e) Breakwaters
(f) Dredging
(g) Air Traffic Control

PART - II

Q2. (a) Discuss various geometric design elements of runway with the help of neat sketches. (2 X 7) = 14 Marks

(b) Explain how taxiways, aprons and runways are different from each other. Further discuss different types of pavements provided at taxiways, aprons and runways with suitable explanations.

OR

(i) Discuss different types of repairs and their methodologies implemented for repair of different pavements at airports.
(ii) Briefly explain the following in context of Airways: ICAO, Minimum circling radius, drainage methods at airports.

Q3. (a) Explain Port and Harbour. Further discuss different types of Ports and Harbours. (2 X 7) = 14 Marks

(b) Write short notes on the following: Coning of wheels, Signalling system and Plate laying methods in railways.

OR

(i) Enlist and briefly discuss various maintenance activities carried out in ports.

(ii) What are navigational aids? Discuss different types of navigational aids used in waterways.

Q4. (a) What is Permanent Way? Briefly explain different components of permanent way along with their functions. (2 X 7) = 14 Marks

(b) Explain Turnouts. Further Illustrate and explain different components of Points and Crossings with the help of neat and clean diagrams.

OR

(i) Calculate the minimum depth of ballast given that sleeper spacing is 70 cm and width of sleeper is 22 cm.

(ii) Determine the length of transition curve for BG track of having a cant of 8 cm. Max. Permissible speed on the curve is 75 kmph.

(iii) With the help of neat sketches discuss different types of Track Junctions used in railway tracks.

(iv) What are different components contributing towards Track Resistance?

Q5. Explain Quay Walls. Discuss the purpose and types of Quay walls. Further explain the construction of different Quay Walls with the help of suitable figures. 14 Marks

OR

What are Breakwaters? Explain their types and construction with the help of suitable diagrams wherever necessary.

Central University of Haryana
VI Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 604A — Max Time: 3 hrs
Course Title: Environmental Engineering-II — Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Population Equivalent

(b) Relative Stability

(c) Grit Chambers

(d) Detritus Tanks

(e) F/M Ratio

(f) Sludge Volume Index

(g) Dry Weather Flow

PART –II

Q. No.2 (a) A 350 mm dia sewer is to flow at 0.35 depth on a grade ensuring a degree of self-cleansing equivalent to that obtained at full depth at a velocity of 0.8m/sec. Find:
(i) the required grade (ii) associated velocity (iii) the rate of discharge at this depth
Given: Manning's rugosity coefficient = 0.014
Proportionate area = 0.315
Proportionate wetted perimeter = 0.472
Proportionate HMD (r/R) = 0.7705
(b) Explain different shapes of sewer pipes and forces acting on sewer pipes with a neat sketch.

OR

Q. No.2(a) Explain physical and chemical characteristics of sewage..
(b) A population of 30,000 is residing in a town having an area of 60 hectares. If the sewerage coefficient of runoff for this area is 0.60, and the time of concentration of design rain is 30 minutes, calculate the discharge for which the sewers of a proposed combined system will be designed for the town in question. Make suitable assumptions where needed.

Q. No.3(a) Explain different types of screens used in screening process. Draw a flow diagram of treatment plant which may be used for very small towns.

(b) Estimate the screen requirement for a plant treating a peak flow of 60 million litres per day of sewage.

OR

Q. No 3(a) Explain different types of sedimentation tanks with neat sketches.

(b) Explain merits and demerits of trickling filters. Determine the size of a high rate trickling filter for the following data:

(i) Sewage flow = 4.5 Mld

(ii) Recirculation ratio =1.5

(iii) BOD of raw sewage = 250 mg/l

(iv) BOD removal in primary tank = 30%

(v) Final effluent BOD desired = 30 mg/l

Q. No.4(a) What do you mean by activated sludge process? Explain methods of aeration. Draw a flow diagram for a conventional ASP giving high degree of treatment.

(b) Explain the methods of distribution system with neat sketches.

OR

Q. No .4(a) Explain thickening of sludge. Draw a neat sketch of gravity sludge thickener.

(b) Design a conventional activated sludge plant to treat domestic sewage with diffused air aeration system, given the following data:

Population = 35,000

Average sewage flow = 180 lpcd

BOD of sewage = 220 mg/l

BOD removed in primary treatment = 30%

Overall BOD reduction required = 85%

Q. No.5(a) What are oxidation ponds and stabilisation ponds? Explain with neat sketches. Also, discuss the design criteria to be adopted for the same.

(b) What are centrifugal and reciprocating pumps? Explain with neat sketches.

OR

Q. No.5(a) Design an oxidation pond for treating sewage from a hot climatic residential colony with 5000 persons, contributing @ 120 litres per capita per day. The 5-day BOD of sewage is 300 mg/l.

(b) Explain septic tank with a neat sketch. What are the design considerations for septic tank? Discuss.

Central University of Haryana
Term End Examination January 2023
B. Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 203A
Course Title: Surveying

Max Time: 3 hrs
Max Marks: 70 marks

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carry two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define Surveying. Enumerate the applications of surveying.

(b) Define Rise and fall method and Height of collimation method.

(c) State the principles of surveying.

(d) List out the tape corrections.

(e) Differentiate between simple levelling and compound levelling.

(f) Define: Contour, Horizontal equivalent and Contour gradient.

(g) What is Trigonometric Levelling? How it is carried out?

PART –II

Q. No.2 (a) Explain the classifications of surveying. Briefly write about the instruments used in Chain surveying.

(b)The bearings of the lines of a traverse are given below. Correct the bearings for local attraction, if any, find the included angles.

Line	Fore Bearing	Back Bearing
AB	68° 15′	248° 15′
BC	148° 45′	326° 15′
CD	224° 30′	46° 00′
DE	217° 15′	38° 15′
EA	327° 45′	147° 45′

OR

Q. No.2 (a) Differentiate between (1) Surveyor's compass and Prismatic compass (2)Meridian and Bearing (3)Fore Bearing and Back Bearing (4)Declination and Dip

(b) A steel tape was exactly 30 m long at 20°C when supported throughout its length under a pull of 10 kg. A line was measured with this tape under a pull of 15 kg and at mean temperature of 32°C and found to be 780 m long. Cross-sectional area of the tape = 0.03 cm^2, and its total weight = 0.693 kg, α for steel = 11 x 10^{-6} per°C and E for steel = 2.1 x 10^6 kg/cm^2. Compute true length of the line if tape was supported during measurement at every 30 m.

Q. No.3(a) What are the methods of levelling? Describe them briefly.

(b)A gradient of 1 in 400 falling elevation 67.45 m was set out by driving pegs at 100 m intervals with top of pegs on the required gradient. After a time it was suspected that some of the pegs had been disturbed and the following observations were taken for checking elevations. List the errors in the levels of pegs, if any

Station	B.S.	I.S.	F.S.	R.L.	Remarks
1	1.76			64.13	
2	2.64		0.720		
3	1.96		1.420		
4		0.93			Peg 1
5		1.20			Peg 2
6		1.50			Peg 3
7		1.76			Peg 4
8		2.03			Peg 5
9		2.30			Peg 6
10	0.69		2.59		Peg 7
11		0.95			Peg 8
12		1.23			Peg 9
13		1.52			Peg 10
14	0.61		1.21		
15			1.72		B.M.

OR

Q. No.3(a) Describe the various characteristics and uses of contour lines. Define curvature and refraction corrections of trigonometric levelling.

(b)Explain direct and indirect methods of contouring. What are the methods of interpolating contours and how is the interpolation done?

Q. No.4(a) Explain the Tangential method of tacheometry.

(b)The following set of readings refers to observations in a tacheometric survey from station B on stations A, C, and D in clock-wise direction.

Staff Station	Vertical angle	Horizontal circle reading	Stadia hair readings
A		301° 10′	
C	-5°12′	152° 56′	1.044, 2.283, 3.522
D	+2° 30′	205° 06′	0.645, 2.376, 4.110

The line BA has a bearing of 58°46′ and the instrument constants are 100 and 0. Find the slope of the line CD and its bearing.

OR

Q. No.4(a) Derive distance equation for staff vertical condition and explain the role of analytic lens in stadia tacheometry.

(b)The following are the distances of the staff position from the instrument and the corresponding staff intervals. Calculate the tacheometric constants.

D (m)	20	50	100	120
S (m)	0.195	0.495	0.997	1.197

Q. No.5(a) Explain Total Station and it's working. Draw the instrument diagram neatly.

(b)Briefly explain the methods of Tacheometric Surveying.

A tacheometer is placed at a station A and readings on a staff held vertical upon a B.M. of RL =100.0 meter and at station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 m respectively. The angle of depression of the telescope in the first case is 6° 19' and in the second case is 7° 42'. Find the horizontal distance from A to B and the RL of station B, if the instrument has constants 100 and 0.5.

OR

Q. No.5(a) What are the elements of a simple circular curve? What is the degree of a curve? Give its relationship with the radius of curve.

(b)Explain the different methods of setting out a simple circular curve.

A railway curve is to be tangential to each of the following lines:

Lines	W.C.B.	Length (m)
AB	0°	-
BC	90°	220
CD	140°	-

Determine the salient parameters of the simple circular curve.

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 503A — **Max Time: 3 Hours**
Course Title: Soil Mechanics — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Define liquid limit and shrinkage limit.
(b)The liquid limit and plastic limit of a sample are 65% and 29% respectively. The percentage of soil fraction with grain size finer than 0.002 mm is 24. What is the activity ratio of the soil sample?
(c) Differentiate between compaction and consolidation.
(d) A fine grained soil is found to be plastic in water content range of 25-44%. Classify the soil as per Indian Standard Classification system.
(e) What is Mohr- Coulomb failure criteria?
(f) Differentiate between discharge velocity and seepage velocity?
(g) Define over consolidation ratio. Also determine its value for NC and OC clays.

PART –II

Q. No.2

(a) Sketch a typical complete grain size distribution curve for (i) well graded soil (ii) gap graded soil (iii) uniformly graded soil. Also define coefficient of uniformity and coefficient of curvature. (8)
(b) The mass of wet soil when compacted in a mould was 1.955 kg. The water content of the soil was 16%. If the volume of the mould was 0.945 litres determine:(i) dry density (ii) void ratio (iii) degree of saturation (iv) percentage air voids. Take G = 2.68. (6)

OR

Q. No.2

(a) What is the use of classification of soils? Describe in detail Indian Standard Classification System for the classification of soils. (8)
(b)The plastic limit of a soil is 33% and its plasticity index is 9%. When the soil is dried from its state at plastic limit, the volume change is 24% of its volume at plastic limit. Similarly the corresponding volume change from the state at liquid limit to dry state is 34% of its volume at liquid limit. Determine the shrinkage limit. (6)

Q. No.3

(a) A deposit of sand has a porosity of 35% and G= 2.7. The soil id dry in top 1.5 m depth, it has 15% moisture content in next 1.8 m depth and submerged below it. Find the effective stress at a depth of 8 m below ground level. Sketch the distribution of the total stress, effective stress and pore water pressure of soil up to 8m. What will be the change in effective stress if water table suddenly drops to a level of 6m below the ground level? (7)

(b) Differentiate between constant head and variable head permeability test. Derive an expression for the determination of coefficient of permeability by constant head permeability test. (7)

OR

Q. No. 3

(a) What is quick sand condition? Under what circumstances it occurs ? What are its preventive measures? (6)

(b) In a falling head permeability test on a sample 12.2 cm high and 44.41 cm^2 in cross sectional area, the water level in the stand pipe of 6.25 mm internal diameter dropped from a height of 75 cm to 24 .7 cm in 15 minutes. Fin the coefficient of permeability of soil. (4)

(c) Write short note on 'capillarity in soils'. (4)

Q. No.4

(a) Describe the effect of (i) water content (ii) compactive effort and (iii) soil type on the compaction characteristics of soils. Illustrate your answer with typical water content v/s dry density plots. (7)

(b) Undisturbed soil sample 30 mm thick got 50% consolidation in 20 minutes with drainage allowed at top and bottom in the laboratory. If the clay layer from which the sample was obtained is 3 m thick in the field conditions, estimate the time it will take to consolidate 50% with (i) double surface drainage (ii) single surface drainage, if in both cases consolidation pressure is uniform. (7)

OR

Q. No .4

(a) A saturated soil has a compression index of 0.25. Its void ratio at a stress of 10 kN/m^2 is 2.02 and its permeability is 3.4×10^{-7} mm/s. Compute:

(i) Change in void ratio if stress is increased to 19 kN/m^2

(ii) Settlement if the soil stratum is 5 m thick

(iii) Time required for 40% consolidation if drainage is one way. (8)

(b) Write short notes on:

(i) Modified Proctor test

(ii) Zero air void line (6)

Q. No.5

(a) Explain Westergaard's theory for the determination of vertical normal stress at a point in a soil mass. How is it different from Boussinesq's solution? (6)

(b) Write Short notes on:

(i) Unconfined compression test

(ii) Vane shear test (8)

OR

Q. No.5

(a) Explain the principle of direct shear test. What are the advantages of this test? What are its limitations? (7)

(b) The shear parameter of a given soil sample are c = 0.26 kg/cm^2 and $\phi = 21^o$. Undrained triaxial tests are to be carried out on the specimens of the soil. Determine:

(i) Deviator stress at which failure will occur if the cell pressure be 2.5 kg/cm^2

(ii) The cell pressure during the test if the sample fails when the deviator stress reaches 1.68 kg/cm^2. (7)

Central University of Haryana
Odd Semester Term End Examination Jan 2023
B. Tech. Programme
Branch: Civil Engineering

Course Code: BT MAT 215A
Course Title: Mathematics-III

Max Time: 3 Hours
Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries a total of 14 marks (Each sub-Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q 1.

a) Define semi-group and monoid.

b) State Lagrange's theorem for subgroups.

c) Define Fourier transform in complex form.

d) Let f be the function defined as $f(x) = \begin{cases} x^3 & if\ x \geq 1, \\ x & if\ 0 \leq x < 1. \\ -x^3 & if\ x < 0 \end{cases}$ Then find the image of f.

e) Find the Laplace transform of $\mathcal{L}\left\{t^{\frac{3}{2}}\right\}$?

f) Find $\mathcal{L}^{-1}\left\{\frac{6s-5}{s^2+7}\right\}$.

g) What is the minimum number of students required in a discrete mathematics class to be sure that at least six will receive the same grade, if there are five possible grades, A, B, C, D, and F?

PART –II

Q 2.

a) Define the relation $\approx$ on $\mathbb{Z}$ by $m \approx n$, in case $m^2 = n^2$. (I) Show that $\approx$ is an equivalence relation on $\mathbb{Z}$.

(II) Describe the equivalence classes for $\approx$. How many are there?

b) Let P = {1,2,3,4,5,6,7,8,9} and Q = {A, B, C, D, E}.

(I) How many 4-element subsets of P are there?

(II) How many permutations, i.e., 5-permutations, of Q are there?

(III) How many license plates are there consisting of 3 letters from Q followed by 2 numbers from P? Repetition is allowed; for example, DAD 88 is allowed.

OR

Q 2.

a) I) Among 200 people, 150 either swim or jog or both. If 85 swim and, 60 swim and jog, how many jog?

II) For $m, n \in \mathbb{Z}$, define $m - n$ in case $m - n$ is odd. Is the relation - reflexive? symmetric? transitive? Is - an equivalence relation?

b) Which of these relations on {0, 1, 2, 3} are partial orderings?

I) {(0, 0), (1, 1), (2, 2), (3, 3)}

II) {(0, 0), (1, 1), (2, 0), (2, 2), (2, 3), (3, 2), (3, 3)}

III) {(0, 0), (1, 1), (1, 2), (2, 2), (3, 3)}

IV) {(0, 0), (1, 1), (1, 2), (1, 3), (2, 2), (2, 3), (3, 3)}

V) {(0, 0), (0, 1), (0, 2), (1, 0), (1, 1), (1, 2), (2, 0), (2, 2), (3, 3)}

Q3.

a) Determine whether the set together with the binary operation is a semi-group, a monoid, or neither. If it is a monoid, specify the identity.

I) Z^+, where $*$ is defined as ordinary multiplication.

II) Z^+, where $*$ is defined as max{a, b}.

III) Z^+, where $*$ is defined as a.

b) Determine whether the set together with the binary operation is a group. If it is a group, specify the identity and inverse.

I) The set of real numbers not equal to -1, where $*$ is defined as $a * b = a + b + ab$.

II) The set of rational numbers, where $*$ is defined as ordinary multiplication.

OR

Q 3.

a) Determine whether the set together with the binary operation is a semi-group, a monoid, or neither. If it is a monoid, specify the identity.

I) Z^+, where $*$ is defined as $a * b = a + b - ab$.

II) The set of even integers where $*$ is defined as $a * b = \frac{ab}{2}$.

b) Determine whether the set together with the binary operation is a group. If it is a group, specify the identity and inverse.

I) $\mathbb{R}$, where $*$ is defined as $a * b = a + b + 2$.

II) The set of odd integers where $*$ is defined as ordinary multiplication.

Q 4.

a) I) Using Laplace transform show that the $\mathcal{L}\{\int_{u=0}^{t} u\, e^{-u} \sin 4u\, du\}$.

II) Find the Laplace transform of the function $f(t) = \begin{cases} t^2, & 0 < t \leq 2 \\ 0, & t > 2 \end{cases}$

b) Solve the differential equation using Laplace transform $y'' + 2y' + 5y = e^{-t}\sin t, y(0) = 0, y'(0) = 1.$

OR

Q 4.

a) I) Find the inverse Laplace transform of the function $\frac{se^{-4s}}{(3s+2)(s-2)}$.

II) Find the inverse Laplace transform of the function $\log\frac{s+1}{s-1}$.

b) Find the inverse Laplace transform of the function using convolution: $\frac{16}{(s-2)(s+2)^2}$.

Q 5.

a) Find the I) Fourier cosine integral II) Fourier sine integral of the function

$$f(x) = \begin{cases} \sin x \ \ if\ 0 \le x \le \pi \\ 0 \ if\ x > \pi \end{cases}$$

b) Find the inverse Fourier sine transform of $\frac{1}{s}e^{-as}$.

OR

Q 5.

a) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2a}, & if\ |x| \le a \\ 0, & if\ |x| > a \end{cases}$

b) Find the inverse Fourier cosine transform of the function $\frac{\sin as}{s}$.

Central University of Haryana
Term End Examination January 2023
B.Tech. (Civil Engineering)

Course Code: BTCE 502A **Max Time:** 3 Hours
Course Title: Design of Concrete Structures **Max Marks:** 70

Instructions:
Question Number one **(PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers **(PART-II)** 2 (two) to 5(five) carry fourteen marks each with internal choice.
Note: IS 456:2000 is allowed to use in the exam.

PART -I

Q. No.1

(a) Explain the terms: i) Creep ii) Workability
(b) Explain terminologies: i) Characteristic Strength ii) Characteristic Load
(c) Give steps for designing the beam subjected to torsional moment.
(d) What are various forms of shear reinforcement?
(e) Distinguish between one-way slab and two-way slab.
(f) What is the difference between long column and short column?
(g) What are footings? Classify them with diagrams.

PART –II

Q. No.2 i) What is Nominal Mix and Design Mix concrete? Explain various steps of mix design.

ii) Briefly explain the different design philosophies of RCC structures

OR

Q. No.2 Design a doubly reinforced rectangular beam having section of 250 mm by 400 mm using Working stress method, subjected to bending moment 40 kNm. Use M 15 concrete and Fe 415 steel.

Q. No.3 i) A singly reinforced R.C.C. beam is subjected to a moment of 80 kNm. The width of the beam is 200 mm. Calculate the depth of the beam and area of steel reinforcement for balance design. Use M20 concrete and Fe 415 steel.

ii) A beam 250 mm × 550 mm effective is subjected to a factored bending moment 300 kNm. Determine the area of steel required. Use M20 concrete and Fe 250 steel. Assume d'= 50mm.

OR

Q. No.3 A simply supported beam 300 mm × 600 mm (effective) is reinforced with 5 bars of 25 mm diameter. It carries a uniformly load 80 kN/m (Including self-weight) over an effective span of 6 m. Out of the 5 main bars, two bars can be bentup safely near the supports. Design the shear reinforcement for the beam. Use M20 concrete and Fe 415 steel.

Q. No.4 A rectangular beam section 200 mm wide and 450 mm overall depth is reinforced with 3 bars of 16 mm diameter at an effective depth of 420 mm. Two hanger bars of 12 mm diameter are provided at the compression face. The effective span of the beam is 5 m. The beam supports a service load of 10 kNm. If M20 concrete and Fe 415 steel is used. Compute short term and long term deflection.

OR

Q. No.4 Design a simply supported roof slab for a room 7.5 m × 3.5 m clear in size. The slab is carrying an imposed load of 5 kN/m^2. Use M20 mix and Fe 415 steel.

Q. No.5 design the reinforcement for a circular column of diameter 500 mm subjected to an ultimate load of 1600 kN and Ultimate moment of 125 kNm about the major axis. Use M20 concrete and Fe 250 steel.

OR

Q. No.5 Design a square footing of uniform thickness for an axial loaded column of 450 mm × 450 mm size. The safe bearing capacity of soil is 190 kN/m2. Load on column is 850 kN. Use M20 Concrete and Fe 415 steel.

Central University of Haryana
VI Semester Term End Examination January 2023
B.Tech. Programme
Branch: Civil Engineering

Course Title: Hydrology and Water Resources **Max. Time: 3 Hours**
Course Code: BT CE 602 A **Max. Marks: 70**

Instructions:

1. Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
2. Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice. If any question has 3 subparts worth 7 marks each, you can attempt any two-part from the three provided, earning 14 marks in total.

Q 1. (7×2=14)

a) Write a short note on the various forms of precipitation.
b) What do you understand by PMP? How are you going to calculate PMP over your project catchment?
c) Explain Penman's Equation.
d) What are the different types of evaporimeter? Explain in brief about Indian Standard Evaporation Pan.
e) Explain positive and negative impact of irrigation on environment.
f) Write short notes on the base period and crop period. Are they equal, justify your statement.
g) What are the objectives of River training works?

Q 2. (2X7=14)

a) Explain scope and application of hydrology to engineering problem?
b) The normal annual rainfall at stations A, B, C and D in a basin are 80, 60, 70, 93 cm respectively. In the year 2010, the station D was inoperative and stations A, B, C are recorded 96, 75, 80cm respectively of rainfall. Estimate rainfall at station D in 2010.

OR

Q 2.

a) What is meant by Maximum-Depth Area-Duration Curves?
b) A catchment has 6 rain gauge stations. In a year, the annual rainfall recorded by the gauge are as follows: -

Station	A	B	C	D	E	F
Rainfall(cm)	82.6	102.9	180.3	110.3	98.8	136.7

For a 10 % error in the estimation of the mean rainfall, calculate the optimum number of stations in the catchment.

Q3. (2X7=14)

a) What do you mean by hyetograph? Describe how it is different from Storm hydrograph.
b) A storm with 12.0 cm precipitation produced a direct runoff of 6.8 cm. The time distribution of the storm is given in table. Estimate ϕ- index

Time from start(hr)	1	2	3	4	5	6	7	8
Incremental rainfall in each hour(cm)	0.56	0.95	1.9	2.8	2	1.8	1.2	0.61

OR

Q 4.

a) Distinguish between:
   i. Infiltration rate and Infiltration capacity
   ii. Actual and Potential Evapo-transpiration

b) Given below are the ordinates of 6-h unit hydrograph over a catchment. Calculate the ordinates of the DRH due to a rainfall excess of 3.5 cm occurring in 6-h.

Time (hrs.)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69
Uh ordinates (m^3/s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0

Q 4. (2X7=14)

a) What do you mean by surface and subsurface irrigation? What are their types? How Border flooding is different from Check and Free flooding techniques.

b) 800 m^3 of water is applied to a farmer Rice field of 0.6 hectares. When the moisture content in the soil falls to 40% of the available water between the field capacity of the soil (36%) and permanent wilting point of soil (15%) of the soil crop combination, determine the field application efficiency. The root zone depth of rice is 60 cm. assume porosity =0.4.

OR

Q 4.

a) What are the methods of irrigation? Explain trickle method in detail with neat sketch.

b) What is meant by duty? Enumerate the different terms by which duty can be impressed. What are the factors affecting duty? The base period of paddy is 120 days. If the duty for this crop is 900 hectares per cumecs, find the value of delta.

Q 5. (2X7=14)

a) What is meant by meandering of rivers and what are its causes? Discuss the meandering parameters with neat and clean sketch.

b) Determine the dimensions of the irrigation canal by Kennedy's theory for the following data:

B/D ratio = 3.24; m= 1.0; N = 0.0225, Q = 5 Cumecs.

OR

a) Design an irrigation channel to carry 40 cumecs of discharge, with base width to depth ratio (B/D) =0.25. The critical velocity ratio is 1.0. Assume a suitable value of Kutter Rugosity coefficient and use Kennedy's method.

b) Discuss the salient features of Kennedy's theory based on critical velocity ratio concept and compare it with Lacey's theory.

Central University of Haryana
Odd Semester Term End Examination Jan 2023
B. Tech. Programme
Branch: Civil Engineering

Course Code: BT MAT 215A
Course Title: Mathematics-III

Max Time: 3 Hours
Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries a total of 14 marks (Each sub-Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q 1.

a) Define semi-group and monoid.

b) State Lagrange's theorem for subgroups.

c) Define Fourier transform in complex form.

d) Let f be the function defined as $f(x) = \begin{cases} x^3 \ \ if\ x \geq 1, \\ x \ \ if\ 0 \leq x < 1. \\ -x^3 \ \ if\ x < 0 \end{cases}$ Then find the image of f.

e) Find the Laplace transform of $\mathcal{L}\left\{t^{\frac{3}{2}}\right\}$?

f) Find $\mathcal{L}^{-1}\left\{\frac{6s-5}{s^2+7}\right\}$.

g) What is the minimum number of students required in a discrete mathematics class to be sure that at least six will receive the same grade, if there are five possible grades, A, B, C, D, and F?

PART –II

Q 2.

a) Define the relation $\approx$ on $\mathbb{Z}$ by $m \approx n$, in case $m^2 = n^2$. (I) Show that $\approx$ is an equivalence relation on $\mathbb{Z}$.

(II) Describe the equivalence classes for $\approx$. How many are there?

b) Let P = {1,2,3,4,5,6,7,8,9} and Q = {A, B, C, D, E}.

(I) How many 4-element subsets of P are there?

(II) How many permutations, i.e., 5-permutations, of Q are there?

(III) How many license plates are there consisting of 3 letters from Q followed by 2 numbers from P? Repetition is allowed; for example, DAD 88 is allowed.

OR

Q 2.

a) I) Among 200 people, 150 either swim or jog or both. If 85 swim and, 60 swim and jog, how many jog?

II) For $m, n \in \mathbb{Z}$, define $m - n$ in case $m - n$ is odd. Is the relation - reflexive? symmetric? transitive? Is - an equivalence relation?

b) Which of these relations on {0, 1, 2, 3} are partial orderings?

I) {(0, 0), (1, 1), (2, 2), (3, 3)}

II) {(0, 0), (1, 1), (2, 0), (2, 2), (2, 3), (3, 2), (3, 3)}

III) {(0, 0), (1, 1), (1, 2), (2, 2), (3, 3)}

IV) {(0, 0), (1, 1), (1, 2), (1, 3), (2, 2), (2, 3), (3, 3)}

V) {(0, 0), (0, 1), (0, 2), (1, 0), (1, 1), (1, 2), (2, 0), (2, 2), (3, 3)}

Q3.

a) Determine whether the set together with the binary operation is a semi-group, a monoid, or neither. If it is a monoid, specify the identity.

I) Z^+, where $*$ is defined as ordinary multiplication.

II) Z^+, where $*$ is defined as max{a, b}.

III) Z^+, where $*$ is defined as a.

b) Determine whether the set together with the binary operation is a group. If it is a group, specify the identity and inverse.

I) The set of real numbers not equal to -1, where $*$ is defined as $a * b = a + b + ab$.

II) The set of rational numbers, where $*$ is defined as ordinary multiplication.

OR

Q 3.

a) Determine whether the set together with the binary operation is a semi-group, a monoid, or neither. If it is a monoid, specify the identity.

I) Z^+, where $*$ is defined as $a * b = a + b - ab$.

II) The set of even integers where $*$ is defined as $a * b = \frac{ab}{2}$.

b) Determine whether the set together with the binary operation is a group. If it is a group, specify the identity and inverse.

I) $\mathbb{R}$, where $*$ is defined as $a * b = a + b + 2$.

II) The set of odd integers where $*$ is defined as ordinary multiplication.

Q 4.

a) I) Using Laplace transform show that the $\mathcal{L}\{\int_{u=0}^{t} u\, e^{-u} \sin 4u\, du\}$.

II) Find the Laplace transform of the function $f(t) = \begin{cases} t^2, & 0 < t \leq 2 \\ 0, & t > 2 \end{cases}$

b) Solve the differential equation using Laplace transform $y'' + 2y' + 5y = e^{-t}\sin t, y(0) = 0, y'(0) = 1.$

OR

Q 4.

a) I) Find the inverse Laplace transform of the function $\frac{se^{-4s}}{(3s+2)(s-2)}$.

II) Find the inverse Laplace transform of the function $\log\frac{s+1}{s-1}$.

b) Find the inverse Laplace transform of the function using convolution: $\frac{16}{(s-2)(s+2)^2}$.

Q 5.

a) Find the I) Fourier cosine integral II) Fourier sine integral of the function

$$f(x) = \begin{cases} \sin x \ \ if\ 0 \le x \le \pi \\ 0 \ if\ x > \pi \end{cases}$$

b) Find the inverse Fourier sine transform of $\frac{1}{s}e^{-as}$.

OR

Q 5.

a) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2a}, & if\ |x| \le a \\ 0, & if\ |x| > a \end{cases}$

b) Find the inverse Fourier cosine transform of the function $\frac{\sin as}{s}$.

Central University of Haryana
V Semester Term End Examination January 2023
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 504A
Course Title: Environmental Engineering-I

Max Time: 3 hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Per capita demand

(b) Coincident draft

(c) Variation in the demand

(d) Streamline settling

(e) Detention time

(f) Specific conductivity of water

(g) Total solids and suspended solids

PART –II

Q. No.2 (a) Explain different types of intakes in detail with neat sketches.

(b)Determine the future population of a satellite town by the Geometric increase method for the year 2011, given the following data:

Year	1951	1961	1971	1981	-	2011
Population in thousand	93	111	132	161	-	?

OR

Q. No.2(a) Explain population forecasting methods in detail.

(b) What are the factors affecting change in the population? What are the sources of surface and ground water? Discuss.

Q. No.3(a) Briefly explain physical, chemical and biological water quality parameters. What are water borne diseases? Explain.

(b) Two primary settling basins are 26m in diameter with a 2.1m side water depth. Single effluent weirs are located on the peripheries of the tank.

For a water flow of 26,000 m^3/d, calculate:

(i) Surface area and volume;

(ii) Overflow rate in m^3/m^2.d;

(iii)Detention time in hours; and

(iv)Weir loading in m^3/m.d

OR

Q. No 3(a) List the methods of purification of water. What are sedimentation tanks? Explain the types of sedimentation tanks in water treatment with neat sketches.

(b) In a continuous flow settling tank 3m deep and 60cm long, what flow velocity of water would you recommend for effective removal of 0.025mm particles at 25°C. The specific gravity of particles is 2.65 and kinematic viscosity v for water may be taken as 0.01 cm^2/sec.

Q. No.4(a) Explain the layouts of distribution networks with a neat sketches.

(b) Explain the methods of distribution system with neat sketches.

OR

Q. No .4(a) Explain the methods of removing temporary and permanent hardness of water.

(b) Explain the methods of defluoridation.

Q. No.5(a) Explain different types of pumps for lifting water with neat sketches. Write down advantages and disadvantages of each type. What are pumping stations?

(b) Write down the factors to be considered for the selection of pumps.

OR

Q. No.5 (a) Explain various types of plumbing systems used in homes for water supply.

(b) Explain the methods of purification of water on small scale.

Central University of Haryana
Term End Examination January 2023
B.Tech. (Civil Engineering)

Course Code: BTCE 623A
Course Title: Project Cost Analysis

Max Time: 3 Hours
Max Marks: 70

Instructions:
Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers (PART-II) 2 (two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) What do you mean by estimate?
(b) Enumerate the different methods to calculate the earthwork.
(c) Explain any two methods of estimates in detail.
(d) State four factors which affects rate analysis.
(e) What are the methods of calculating depreciation?
(f) What is Rate analysis?
(g) Explain the following term i) Salvage Value ii) Scrap Value

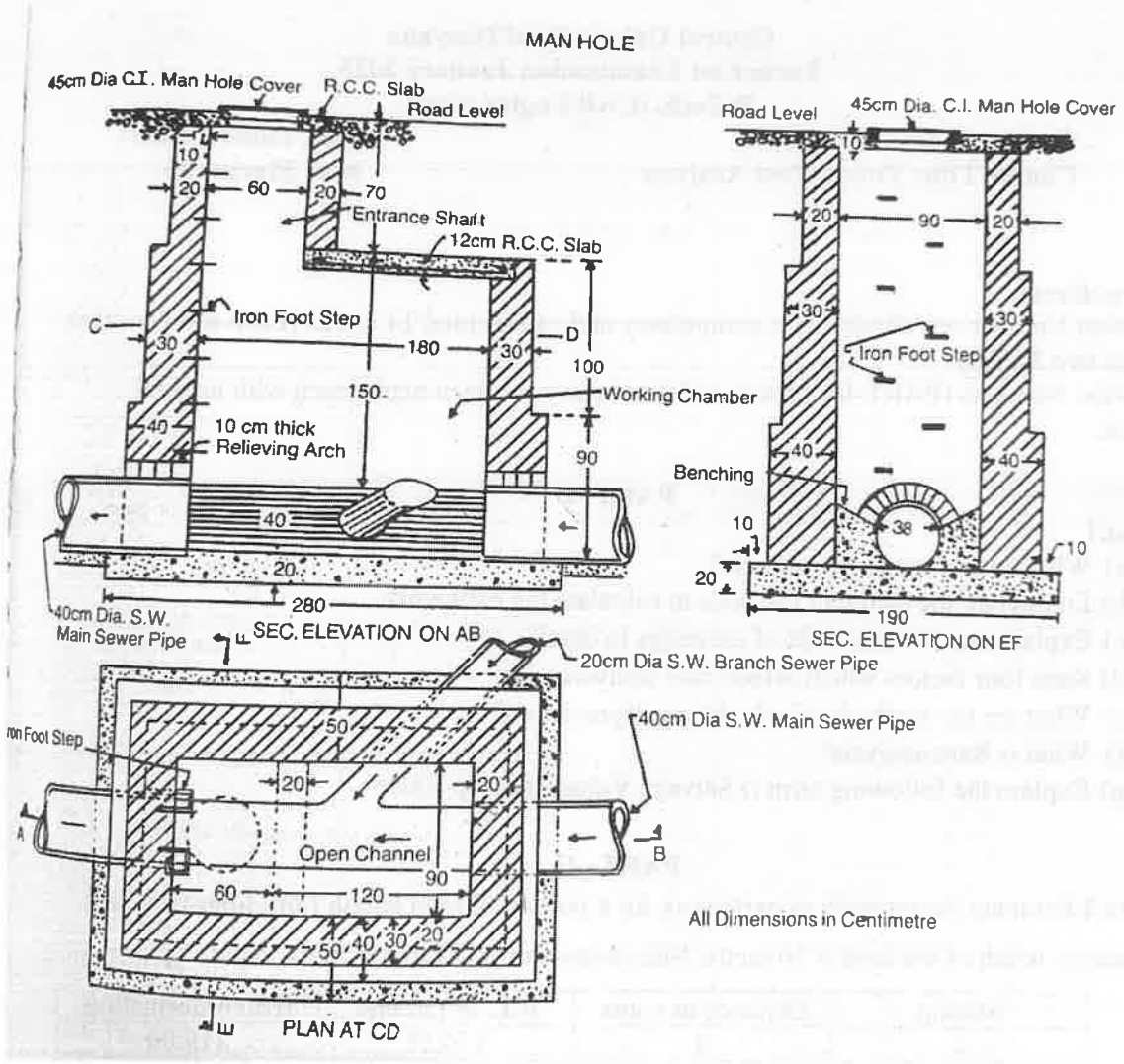
PART –II

Q. No.2 Estimate the quantity of earthwork for a portion of road length from following data. Formation width of the load is 10 metre. Side slopes are 2:1 banking, 1.5:1 in cutting.

Station	Distance in metre	R.L. of Ground	R.L. of formation
1	0	114.50	115.00
2	100	114.75	‖ Upward gradient 1 in 200
3	200	115.25	
4	300	115.20	
5	400	116.10	
6	500	116.85	
7	600	118.00	‖ Downward gradient of 1 in 400 ‖
8	700	118.25	
9	800	118.10	
10	900	117.75	
11	1000	117.90	
12	1100	117.90	
13	1200	119.50	

OR

Q. No.2 Prepare a detailed estimate of Manhole from the given drawing and general Specifications.
General specifications: Foundation and floor concrete shall be of 1:3:6 cement concrete with brick ballast. Brickwork shall be of first class in 1:4 cement mortar and inner faces of wall shall be pointed with 1:2 cement mortar. Inside channels and benching floor shall be finished with 20 mm thick plastering with 1:3 cement mortar.



Q. No.3 Write down the detailed specifications of the Road work

OR

Q. No.3 Write the detail specifications of the following items. i ii. Brickwork

Q. No.4 Find the Rate analysis for 10 cu.m. RCC work of Cement concrete 1:2:4

OR

Q. No.4 Find the Rate analysis for 100 sq.m. 2.5 cm Cement Concrete Floor

Q. No.5 a) What are the different methods of Valuation? Explain briefly.

b) Briefly explain the following terms

i) Depreciation ii) Sinking Fund iii) Annuity iv) Outgoings

OR

Q. No.5 A two storied RCC building is located on 250 sq m plot, having plinth area of 100 sq m. The building life may be taken as 60 years. The building fetches a gross rent of Rs 40000/month. Work out the capitalized value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken as Rs 1,00,000 per sq m. Other data may be assumed suitably.

Central University of Haryana
3rd Semester End Term Examination (Regular) Jan 2023

Programme: B.Tech (Civil Engineering) **Semester:** 3rd
Course Code: BT CE 201 A **Max Time:** 3hrs
Course Title: Strength of Materials **Max Marks:** 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

a) A steel rod 1 m long and 20 mm x 20 mm in cross section is subjected to a tensile force of 40 kN. Determine the elongation of the rod, if the modulus of elasticity for the rod material is 200 GPa.
b) State clearly Hook's Law.
c) A Steel wire of 10 mm diameter is bent into a circular arc of 20 meter radius. Determine the maximum stress induced in it. Take $E=2x10^5$ N/mm^2
d) How will you find the strength of a solid shaft?
e) Explain the term slenderness ratio and describe with the mathematical expression, how it limits the use of Euler's formula for crippling load.
f) State Mohr's IST and IInd theorem.
g) Define Conjugate beam and give the relation between actual beam and conjugate beam.

PART –II

Q. No.2

a) Discuss the stress-strain diagram for ductile and brittle material in detail.
b) The stresses at point of a machine component are 150 MPa and 50 Mpa both tensile in nature. Find the intensities of normal, shear and resultant stresses on a plane inclined at an angle of 55° with the axis of major tensile stress. Also find the magnitude of the maximum shear stress in the component.
c) A simply supported beam 6 m long is carrying a uniformly distributed load of 5kN/m over a length of 3 m from the right end. Draw the shear force and bending moment diagram for the beam and also calculate the maximum bending moment of the section.

Q. No.3

a) Define the term bending stress and prove the Prove the Relation,

$$\frac{M}{I} = \frac{\sigma}{y} = \frac{E}{R}$$

Where M is bending moment, I is moment of Inertia of the section, σ is bending stress, E is Young's Modulus of Elasticity, R is radius of Curvature.
b) A rectangular beam 60 mm wide and 150 mm deep is simply supported over a span of 6 m. If the beam is subjected to central point load of 12 kN, find the maximum bending stress induced in the beam section.
c) A 300 mm x 150 mm I-girder has 12 mm thick flange and 8 mm thick web. It is subjected to shear force of 150 kN at a particular section. Find the ratio of maximum shear stress to minimum shear stress in the web. What is the maximum shear stress in the flange?

Q. No.4

a) Explain the term Torque and Polar modulus. Also find the maximum torque, that can be safely applied to a shaft of 80 mm diameter. The permissibe ange of twist is 1.5 degree in a length of 5 m and shear stress not to exceed 42 MPa. Take C = 84 GPa

b) A hollow steel shaft of 300 mm external diameter and 200 mm internal diameter has to be replaced by a solid alloy shaft. Assuming the same values of polar modulus for both, calculate the diameter of the solid alloy shaft and work out the ratio of their torsional rigidities. Take C (Modulus of Rigidity) for steel as 2.4 C for alloy.

c) A hollow alloy tube 4 m long with external and internal diameter of 40 mm and 25 mm respectively was found to extend 4.8 mm under a tensile load of 60 kN. Find the buckling load for the tube with both ends pinned. Also find the safe load on the tube, taking factor of safety as 5.

Q. No.5

a) State the relationship between slope, deflection and radius of curvature of a simply supported beam. Also find the expression for slope of a beam at the support A and deflection of the beam at its centre if a simply supported beam AB of span L and stiffness EI carries a concentrated load P at its centre.

b) With the help of moment are method find the deflection of the cantilever beam at its free end if a cantilever beam of span 2.8 m is subjected to gradually varying load from zero at the free end to 20 kN/m over fixed end. Take EI for the cantilever beam as 8×10^{12} N-mm^2

c) A beam ACB of length L, simply supported at the ends has moment of inertia 4I for the length AC and I for the length CB and is loaded with point load W at C. Using Conjugate beam method determine i) slope at end A and ii) deflection at mid span. Also compute the numerical values taking W= 8kN, length of CB portion is 2.5 m and total length (L) of beam ACB is 12.5 m, I = 5000cm^4 and E = 2×10^5 N/mm^2

Central University of Haryana
Term End Examination January 2023
B.Tech. Programmes
Branch: CIVIL ENGINEERING

Course Code: BT CE 342 A
Course Title: Building Construction

Max Time: 03 Hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART - I

Q1. Answer the following chronologically: (2 X 7 = 14)

a) Explain toothing.
b) Describe Lintels.
c) Write a short note on cantilever scaffolding.
d) Discuss the causes of dampness in structures.
e) Write short note on strip footing.
f) Write a short note on quality inspection of brickwork.
g) Classify building construction as per National Building Code.

PART - II

Q2. (a) What is Foundation? Highlight the differences between shallow and deep foundations. (2 X 7) = 14 Marks

(b) Pictorially discuss different bonds used in brick masonry. Also enlist different factors contributing towards strength of brickwork.

OR

(i) Highlight the differences between load bearing and partition walls. Further show different parts of a cavity wall with the help of a neat sketch.
(ii) Explain different types of piles on the basis of load transfer mechanism. Further discuss the suitability factors for use of pile foundations.

Q3. (a) Explain safe bearing capacity of soil. Further discuss raft and well foundations. (2 X 7) = 14 Marks
(b) What is scaffolding? Discuss how scaffolding is different from formwork.

OR

(i) Pictorially explain the following: Racking back, Lap, Perpends, Bed and Bed joint.

(ii) With the help of a neat sketch briefly explain different parts and terminologies associated with a staircase.

Q4. (a) With the help of neat sketch illustrate different parts of a window. Also, enlist the considerations to be made while finalizing the location of an opening in a wall. (2 X 7) = 14 Marks

(b) Explain Dampness. What are the sources of dampness in a building? Further highlight the effects of dampness in a building.

OR

(i) What are the requirements for a well planned roof? Further discuss the classification of Pitched roofs.

(ii) Explain the purpose of building finishes. Further discuss any three building finishes.

Q5. (a) Discuss the considerations for fire resistant construction of buildings. (2 X 7) =14 Marks

(b) Explain different dampness prevention techniques. List out the precautions to be taken while applying various dampness prevention techniques.

OR

(i) What are floors? Discuss the functional requirements from a floor in a building. Further enlist selection criteria for flooring materials.

(ii) Write a short note on: Sound Insulation, Fire Insulation.

Central University of Haryana
Fifth Semester Term End Examination Jan. 2023
B.Tech. Programme
Branch: Civil Engineering

Course Code:	BT CE 301A	**Max Time: 3h**
Course Title:	Structural Analysis-II	**Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

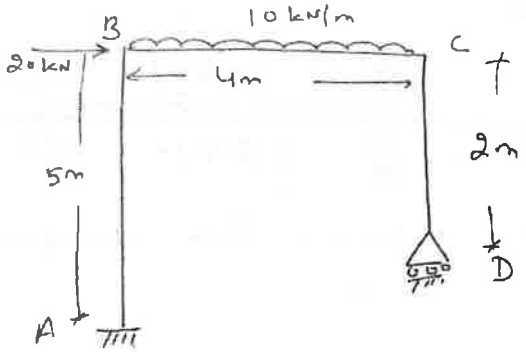
PART -I

Q. No.1

(a) Define flexibility matrix.
(b) Define Distribution factor.
(c) Define Kinematic indeterminacy.
(d) Draw a non-sway frame.
(e) Define shape factor.
(f) Define stiffness.
(g) Define carry over factor.

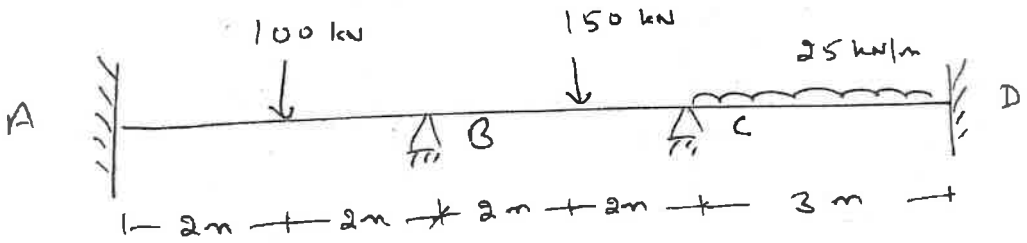
PART –II

Q. No.2: Analyse the frame using flexibility method of analysis and draw BMD.

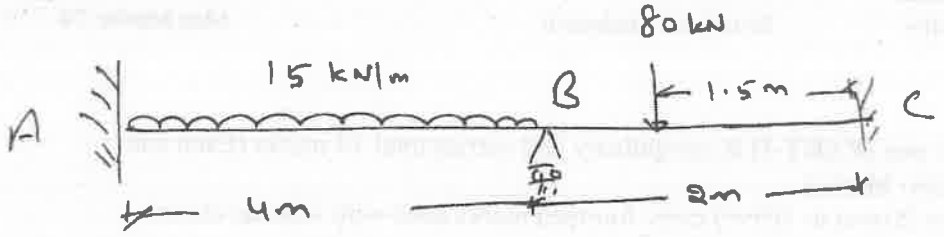


OR

Q. No.2: Draw Stiffness matrix and determine unknown independent displacement coordinates.

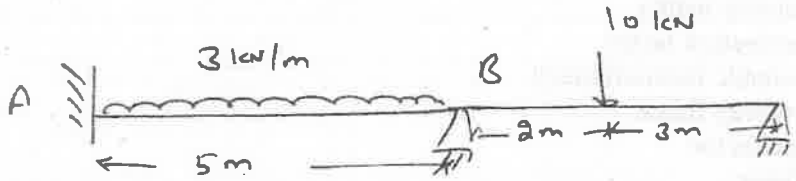


Q. No.3: Analyse the continuous beam using slope-deflection method and draw SFD and BMD.

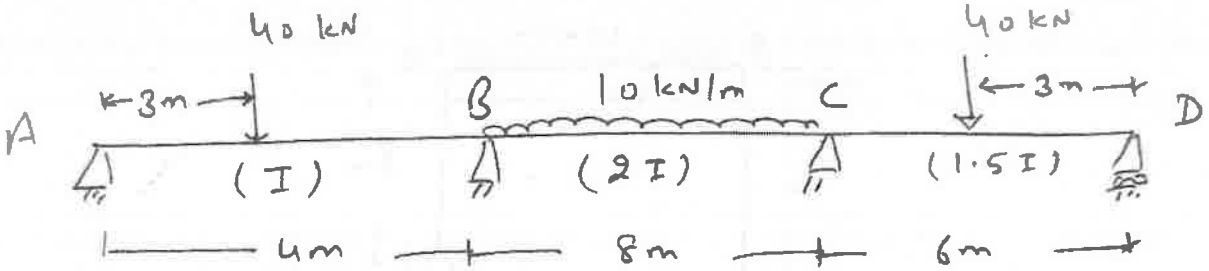


OR

Q. No 3: Analyse the beam using Moment-Distribution method and draw BMD.

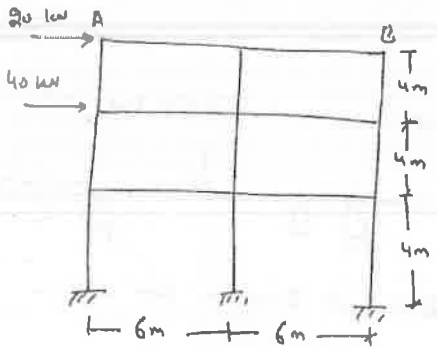


Q. No.4: Determine final moments for the given beam using Kani's method.



OR

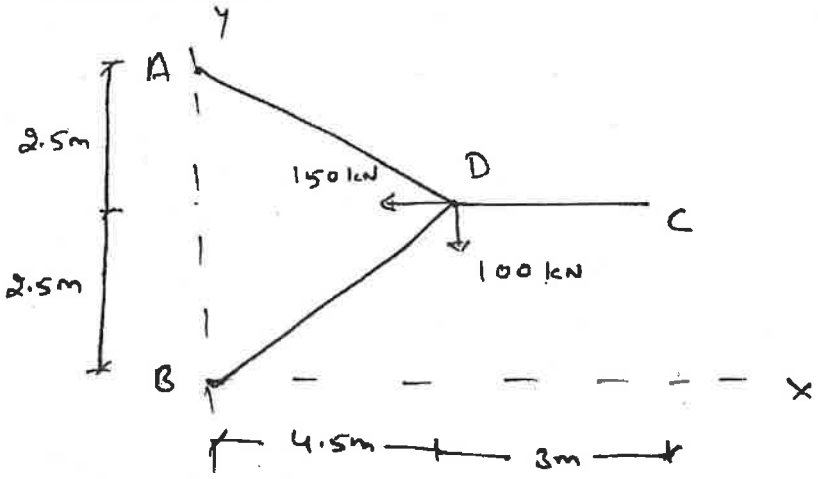
Q. No .4: Differentiate between portal and cantilever method of analysis with the help of an example. Find Bending moment at A in the given frame using portal method of analysis.



Q. No.5: Define Mechanism. Draw different type of mechanisms. Differentiate between lower bound and upper bound theorem with the help of an example.

OR

Q. No.5: Calculate forces in the member DA, DB and DC in the given structural member using Tension Coefficient method.



Central University of Haryana
VIIth Semester Term End Examination December 2022
B.Tech. Programmes
Branch:Computer science & Engineering

Course Code: BT CS 721 **Max Time: 3 Hrs**
Course Title: Information Security **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Explain the following:

(a) Inverse prime

(b) Key stream Generator

(c)Euclidean Algorithm

(d)Difference between stream cipher and Block cipher

(e)Modular Arithmetics & its properties

(f) Fermets Theorems

(g)DES

PART –II

Q. No.2 Describe substitution and transposition techniques with example.

OR

Q. No.2 Differentiate between symmetric and Asymmetric key cryptography with diagram. Also justify the need of asymmetric key cryptography.

Q. No.3 Explain AES and DES stepwise with diagrammatic representation

OR

Q. No 3 Discuss Linear and Differential Cryptanalysis stream cipher

Q. No.4 Explain RC4 Cryptosystem with example

OR

Q. No .4 What is the role of hashing function in Information Security? Explain Hashing function with, feature of MD5 & SHA Algorithm with security of Hashing functions

Q. No.5 What is digital certificate? What are its benefit. Explain X.509 with diagram.

OR

Q. No.5 Explain electronic mail with security tools and Message Authentication code with neat diagram.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: B. Tech.-Computer Science and Engineering

Course Code: BT CS 701 **Max Time: 03 hrs**
Course Title: Machine Learning **Max Marks:70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 Explain the following points in brief:

(a) Stochastic Gradient Descent

(b) Difference between Unbiased Learner and Weak Learners.

(c) Differentiate between semi-definite kernels and linear kernel

(d) Fisher's linear discriminant

(e) AGNES

(f) Regression Trees

(g) Difference between hypothesis space and inductive bias

PART –II

Q. No.2 What do you mean by Gradient Descent? Derive the Gradient Descent Rule. What are the conditions in which Gradient Descent is applied? Also mention the difficulties observed in applying the Gradient Descent.

OR

Q. No.2 Define Machine learning? Briefly explain the types of learning? Explain inductive biased hypothesis space.

Q. No.3 Illustrate the Kernel Mapping and Kernel Construction in detail. What is Polynomial Kernel and How would you explain the Convex Hull in association with Support Vector Machines?

OR

Q. No 3 Explain how are the weights determined in Radial Basis Functions Network? Do Radial Basis Function Networks trained through Gradient Descent benefit the Logistic Regression? Justify your answer.

No.4 How trees and rules "greedily" partition data into interesting segments? Illustrate with an example. List the issues in Decision Tree Learning.

OR

Q. No .4 Discuss Rough k-Means, Fuzzy k-Means, k-Harmonic Means Algorithm in detail with example.

Q. No.5 Differentiate between Gaussian Mixture Models and K-Means. What are the issues faced by Gaussian mixture models during learning process from unlabelled data?

OR

Q. No.5 Describe K-nearest neighbour learning algorithm for continuous valued target function. Discuss the major drawbacks of K-nearest neighbour learning algorithm and how it can be corrected? What is parameter "K" in KNN and how changing it can affect the algorithm?

Central University of Haryana
Odd Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Computer Science & Engineering

Course Code: BT CS 702 **Max Time:3 hour**
Course Title: Principles of Cloud Computing **Max Marks:70**
Semester: VII

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 [2X7=14]

a. Define Cloud Computing according to NIST.
b. Write four disadvantages of cloud computing.
c. Explain the fundamental idea behind virtual machine.
d. What is para virtualization?
e. Explain dishonest computation in remote servers.
f. What are the key mechanisms for protecting cloud data?
g. Write the importance of Eucalyptus cloud platform.

PART –II

Q. No.2

a. What is Cloud Cube Model? Discuss all the distinct dimensions that the Cloud Cube Model identifies. [2+8]
b. Discuss Gossip protocol in detail. [4]

OR

c. It is possible to organize all the concrete realizations of cloud computing into a layered view covering the entire stack, from hardware appliances to software systems. In this respect discuss the Cloud Architecture in detail. [8]
d. Write short note on Secure Shell protocol (SSHP) [6]

Q. No.3

a. The component that provides virtual environments is a VMM. However the implementation of VMMs varies greatly. In this respect discuss different virtual environments of VMM [10]
b. Discuss trap-and-emulate virtualization implementation methods. [4]

OR

c. Write short notes on the following (i) Binary translation in virtualization, (ii) Hardware Assisted virtualization [4+3]
d. Why portability and interoperability are difficult to achieve. [7]

Q. No.4

a. Discuss some of the important aspects of data security in the context to cloud computing. [7]

b. Explain that how cloud management work and what are its benefits. [7]

OR

c. Cloud Lifecycle Management is a solution that defines and manages the complete lifecycle of cloud services. Justify your answer. [8]

d. Identity Management is a primary mechanism for controlling access to data in the cloud. Justify the statement with detail explanation. [6]

Q. No.5

a. What is cloud federation? Why cloud federation is needed? Also write the advantages obtained by CSPs in the federation. [2+2+2]

b. Define the following terms, (i) Coalition Game, (ii) transferable utility (iii) non-transferable utility [4]

c. Explain that when Coalition formation game is classified as Hedonic game [4]

OR

d. Describe the usage of Eucalyptus and its architecture [2+6]

e. Discuss two different virtualization software of VMware [3+3]

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations December 2022

Programme: B.Tech. CSE **Session: 2021-22**

Semester: VII **Max. Time: 3 Hours**

Course Title: Agriculture and Environment **Max. Marks: 70**

Course Code: SIAS EVS 01 03 06 GE 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and students need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) What is sustainable agriculture? Discuss different techniques for the adoption of sustainable farming?

b) Write short notes on zero tillage, agro-forestry and dry land farming?

c) Discuss the role of integrated pest management in sustainable agriculture?

d) What are pesticides? Explain in brief pesticide safety?

e) What are macro and micro-nutrients? Discuss the environmental effect of chemical fertilizers?

f) What are the essential conditions necessary for the survival of compost worms? Explain?

g) What are genetically modified crops? Discuss the potential risks of genetically modified crops?

Q 2. (2X7=14)

a) With the help of figure discuss benefits of sustainable farming and describe different methods and practices of sustainable farming?

b) What is hydroponic greenhouse cultivation? Discuss types of hydroponic methods used for cultivation and factors affecting it?

c) Write short notes on agro forestry, social forestry and zero tillage? Explain how the irrigation projects directly and indirectly effects our environment?

Q 3. (2X7=14)

a) What are Plant Incorporated Protectants? Discuss the different categories of biopesticides used to control pests?

b) What is integrated pest management? How does the integrated pest management program works?

c) What are pesticides and persistent pesticides? Explain in detail main classes of synthetic pesticides?

Q 4. (2X7=14)

a) Discuss the different types of biofertilizers used to enhance the crop yield in detail?

b) Explain in detail the principles and components of integrated nutrient management systems?

c) What are the different types of earthworm species used in vermicomposting? Explain the methodology and production process of vermicomposting?

Q 5. (2X7=14)

a) What are transgenic plants? Explain the benefits of development of genetically modified crops and its impact on environment?

b) Write short notes on agriculture and food security and green revolution? Discuss the effects of climate change on agriculture?

c) Explain the role of microorganisms in sustainable agriculture and environment?

CENTRAL UNIVERSITY OF HARYANA

Term End Examinations December 2022

Programme: B.Tech. CSE | **Session: 2022-23**
Semester: VII | **Max. Time: 3 Hours**
Course Title: Creative Writing | **Max. Marks: 70**
Course Code: SHSS ENG 01 03 E 09 3104

Instructions:

1. Question no. 1 has seven parts and students are required to answer any four. Each part carries three and half Marks.
2. Question no. 2 to 5 have three parts and students are required to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) What do you understand by the term 'Creativity'?

b) How does imagination work behind creativity?

c) What is the difference between denotation and connotation?

d) Define the terms:

i) Metaphor

ii) Symbol

e) Explain the four functions of language.

f) Define any one of the following:

a) Hard News

b) Soft News

g) Explicate the importance of reviewing and revising in preparing manuscripts for publication.

Q 2. (2X7=14)

a) What are the parameters of measuring creativity? Discuss in detail.

b) Explain the proposition that 'creativity can be taught or not'.

c) Define the following terms:-

I. Personification

II. Alliteration

III. Hyperbole

IV. Paradox

Q3. (2X7=14)

a) Define Children's Literature and what are the things we should keep in our mind while writing for children. Explain.

b) What is Drama? Discuss its type and elements.

c) What is Fiction? Explain Its various types of fiction in detail.

Q 4. (2X7=14)

a) Discuss in detail the important points which need to be kept in view writing an article.

b) What are the techniques of writing headlines? Explain.

c) How do you write up a magazine? which topics can you select for magazine? Discuss.

Q 5. (2X7=14)

a) How do you publish your creative writing? Explain.

b) What are the techniques which you should follow while writing for publication?

c) Why editing is important in creative writing? Explicate.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 724A — **Max Time: 3 hrs**
Course Title: GROUND IMPROVEMENT TECHNIQUES — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Densification
(b) Grid Rollers
(c) Mechanical Stabilization
(d) Fill
(e) Soil Stabilization
(f) Compressibility
(g) Stone Columns

PART –II

Q. No.2 Explain the classification of ground improvement techniques.
OR
Q. No.2(a)Briefly explain the principle of compaction with field procedure.
(b) What are the quality control requirements in the field under compaction method?

Q. No.3 (a)Explain the vibro-flotation and compaction pile techniques in detail with neat sketches.
(b)What do understand by vibro-compaction and dynamic compaction for ground improvement in granular soil? Discuss in detail with neat sketches.
OR
Q. No 3 What do you understand by drains? Explain different types of drains. What do you mean by vertical and radial consolidation? Discuss in detail with neat sketches.

Q. No.4 Explain various grouting techniques used for ground improvement along with the type of materials used. Write down the mechanics of lime-soil interaction.
OR
Q. No .4(a) Briefly explain soil-cement stabilization and fly ash-lime stabilization methods with construction steps involved.
(b) Explain soil-bitumen stabilization method of construction technique. Also, explain construction steps involved along with proportioning, materials used, equipments, etc.

Q. No.5(a)What do mean by soil-reinforcement technique? Explain the columns formed in-situ with thermal methods involved in.
(b)Write down the applications of soil-reinforcement in ground improvement technique.
OR
Q. No.5 What are geosynthetics? Explain different types of geosynthetics. Write down their properties, functions and applications in detail.

Central University of Haryana

V/VII & Re-Appear VI Semester Term End Examination December 2022

B.Tech. Programme

Branch: Civil Engineering

Course Title: Environmental Engineering – II **Max. Time: 3 Hours**

Course Code: BT CE 604A **Max. Marks: 70**

Instructions:

1. Question Number one (PART-I) is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
2. Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice. If any question has 3 subparts worth 7 marks each, you can attempt any two-part from the three provided, earning 14 marks in total.

Q 1. (7×2=14)

(a). What is design period? Write down the various standard design periods for different components of the sewerage scheme.

(b). What do mean by chemical quality parameters of sewage. Explain significance of B.O.D/C.O. D ratio in brief.

(c). Why separate grit chamber is provided before primary sedimentation tank in sewage treatment plant?

(d). Write a short note on Activated sludge process

(e). Enlist the various processes involved in the Secondary and tertiary Treatment of Sewage.

(f). Explain the land disposal method of sewage in short.

(g). What is Sewage farming? Enlist the names of crops should be grown on such farms?

Q2 (2X7=14)

a) Explain the importance of the following in the design of sewers:
(I) Self-cleansing velocity (II) Non scouring velocity.

b) Design a sewer running 0.7 times full at maximum discharge for a town provided with the separate system, serving a population 80,000 persons. The water supplied from the water works to the town is at a rate of 190 LPCD. The manning's n = 0.013 for the pipe material and permissible slope is 1 in 600. Variation of n with depth may be neglected. Check for minimum and maximum velocity assuming minimum flow 1/3 of average flow and maximum flow as 3 times the average. (For d/D = 0.7, q/Q = 0.838, v/V = 1.12)

c) A city has a projected population of 60,000 spread over area of 50 hectare. Find the design discharge for the separate sewer line by assuming rate of water supply of 250 LPCD and out of this total supply only 75 % reaches in sewer as wastewater. Make necessary assumption whenever necessary

Q3. (2X7=14)

a) How sedimentation with coagulation is achieved? Explain in what condition it is suitable for the sewerage treatment.

b) Design a bar screen chamber for average sewage flow 20 MLD, minimum sewage flow of 12 MLD and maximum flow of 30 MLD.

c) Design a rectangular grit chamber and square grit chamber for treatment of sewage with average flow of 8.5 MLD and peak flow factor of 2.25.

Q 4. (2X7=14)

a) How secondary Treatment through Activated Sludge Process is achieved? Explain in detail.

b) What is Trickling filter. Explain its different types and operation in detail.

c) What are the various methods of sewage disposal? Write down the advantages of dilution method of sewage disposal

Q 5. (2X7=14)

a) What are the various sewer appurtenances? Explain in detail with reference to their importance in sewer system.

b) How layout, testing and Maintenance of sewers is done? Explain with neat sketches.

c) Explain the followings in detail with neat sketches -

I. Imhoff tanks
II. Oxidation Ponds

Central University of Haryana
V Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 504A — **Max Time: 3 hrs**
Course Title: Environmental Engineering-I — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Per capita demand
(b) Coincident draft
(c) Variation in the demand
(d) Streamline settling
(e) Detention time
(f) Specific conductivity of water
(g) Total solids and suspended solids

PART –II

Q. No.2 (a) Explain different types of intakes in detail with neat sketches.
(b)Determine the future population of a satellite town by the Geometric increase method for the year 2011, given the following data:

Year	1951	1961	1971	1981	-	2011
Population in thousand	93	111	132	161	-	?

OR

Q. No.2(a) Explain population forecasting methods in detail.
(b) What are the factors affecting change in the population? What are the sources of surface and ground water. Discuss.

Q. No.3(a) Briefly explain physical, chemical and biological water quality parameters. What are water borne diseases? Explain.
(b) Two primary settling basins are 26m in diameter with a 2.1m side water depth. Single effluent weirs are located on the peripheries of the tank.
For a water flow of 26,000 m^3/d, calculate:
(i) Surface area and volume;
(ii) Overflow rate in m^3/m^2.d;
(iii)Detention time in hours; and
(iv)Weir loading in m^3/m.d

OR

Q. No 3(a) List the methods of purification of water. What are sedimentation tanks? Explain the types of sedimentation tanks in water treatment with neat sketches.
(b) In a continuous flow settling tank 3m deep and 60cm long, what flow velocity of water would you recommend for effective removal of 0.025mm particles at 25°C. The specific

gravity of particles is 2.65 and kinematic viscosity v for water may be taken as 0.01 $cm^2/sec.$

Q. No.4(a) Explain the layouts of distribution networks with a neat sketches.
(b) Explain the methods of distribution system with neat sketches.
OR
Q. No .4(a) Explain the methods of removing temporary and permanent hardness of water.
(b) Explain the methods of defluoridation.

Q. No.5(a) Explain different types of pumps for lifting water with neat sketches. Write down advantages and disadvantages of each type. What are pumping stations?
(b) Write down the factors to be considered for the selection of pumps.
OR
Q. No.5 (a) Explain various types of plumbing systems used in homes for water supply.
(b) Explain the methods of purification of water on small scale.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 724A — **Max Time: 3 hrs**
Course Title: GROUND IMPROVEMENT TECHNIQUES — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Densification
(b) Grid Rollers
(c) Mechanical Stabilization
(d) Fill
(e) Soil Stabilization
(f) Compressibility
(g) Stone Columns

PART –II

Q. No.2 Explain the classification of ground improvement techniques.
OR
Q. No.2(a)Briefly explain the principle of compaction with field procedure.
(b) What are the quality control requirements in the field under compaction method?

Q. No.3 (a)Explain the vibro-flotation and compaction pile techniques in detail with neat sketches.
(b)What do understand by vibro-compaction and dynamic compaction for ground improvement in granular soil? Discuss in detail with neat sketches.
OR
Q. No 3 What do you understand by drains? Explain different types of drains. What do you mean by vertical and radial consolidation? Discuss in detail with neat sketches.

Q. No.4 Explain various grouting techniques used for ground improvement along with the type of materials used. Write down the mechanics of lime-soil interaction.
OR
Q. No .4(a) Briefly explain soil-cement stabilization and fly ash-lime stabilization methods with construction steps involved.
(b) Explain soil-bitumen stabilization method of construction technique. Also, explain construction steps involved along with proportioning, materials used, equipments, etc.

Q. No.5(a)What do mean by soil-reinforcement technique? Explain the columns formed in-situ with thermal methods involved in.
(b)Write down the applications of soil-reinforcement in ground improvement technique.
OR
Q. No.5 What are geosynthetics? Explain different types of geosynthetics. Write down their properties, functions and applications in detail.

CENTRAL UNIVERSITY OF HARYANA

Re-Appear VI Semester End Term Examination December 2022

Programme: B.Tech (Civil Engineering) **Semester: VI**

Course Title: Concrete Technology **Max. Marks: 70**

Course Code: BT CE 601A **Max. Time: 3 Hours**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

Q 1. (4X3.5=14)

a) Tabulate the different grade of concrete as per IS Code.

b) What are the major Bogue's Compounds of cement?

c) Tabulate the recommended slump value as per IS 456:2000 depend on placing condition and degree of workability.

d) Draw the typical stress-strain curve for concrete.

e) Differentiate between Nominal Mix, Standard Mix and Design Mix.

f) List the name of compound used as inhibitors of iron corrosion.

g) Define light weight concrete.

Q 2. (2X7=14)

a) List the various types of cement indicating their use for different application.

b) Describe the deleterious substance present in aggregate as per IS 383. Discuss the limits of deleterious substance as per codal provison for coarse and fine aggregates.

c) What are air-entraining admixtures? How do they affect the water-cement ratio, segregation and bleeding.

Q3. (2X7=14)

a) Define Workability of concrete; enlist the different method for measuring it in the laboratory. Also discuss the factors affecting the workability of fresh concrete.

b) Define Curing. Classify it and describe its role.

c) Define the different types of concrete strength. Describe the relation between them. Describe the split tension test performed on hardened concrete to determine tensile strength of concrete.

Q 4. (2X7=14)

a) Calculate the quantities of ingredients required to produce one cubic meter of structural concrete. The mix is to be used in proportions of one part of cement to 1.37 parts of sand to 2.77 parts of 20 mm nominal size crushed coarse aggregate by dry volumes with a water- cement ratio of 0.49 (by mass). Assume the bulk densities of

cement, sand and coarse aggregate to be 1500, 1700, and 1600 kg/m^3, respectively. The percentage of entrained air is 2.

b) What do you mean by proportion of concrete mix? Discuss the factors influence the choice of mix design. Explain any one of them in details.

c) Explain the importance of grading? Why, Theoretical grading, which produce maximum density cannot be used in practice.

Q 5. (2X7=14)

a) Define Corrosion. Describe the causes for corrosion of steel in concrete. What are the factors which influence the corrosion?

b) Describe carbonation in concrete. Explain the various factors which affect the rate of carbonation.

c) Enlist the principal techniques for under water concreting. Briefly describe the Tremie method for underwater concreting.

Central University of Haryana
Odd Semester Term End Examination December 2022
B.Tech. Programmes

Branch: Civil Engineering
Course Code: BT MGT 706 A
Course Title: Entrepreneurship

Max Time: 3 Hrs
Max Marks: 70

Instructions:

Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).

Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1 (2*7 = 14)

a) Define Rural Entrepreneurship?
b) Write any two problems faced by Women Entrepreneurs?
c) Write any two opportunities linked with International Entrepreneurship?
d) Differentiate between Private sector and Public sector enterprises?
e) Define reasons for business plan failures?
f) Define MSMEs on the basis of investment in plant & machinery and annual turnover?
g) Write any four objectives of Entrepreneurial Development Programmes?

PART –II

Q. No.2 Differentiate between an Entrepreneur and a Manager? Explain the Managerial, Promotional and Commercial functions of Entrepreneurs with suitable examples (14 marks)

OR

Q. No.2 Define Tourism Entrepreneurship? Describe with suitable examples the following characteristics of Entrepreneurs: risk bearer, innovative, foresight and hard work? (14 marks)

Q. No.3 Differentiate between competence and competency, Also explain all the attributes of entrepreneurial competency by taking a case of a newly passed civil engineer? 14 marks)

OR

Q. No 3 Mention any four barriers to creativity and explain the relevance of Maslow's need hierarchy theory towards generating Entrepreneurial motivation? (14 marks)

Q. No.4 Describe, in brief any two techniques of generating new ideas and explain the types, role and importance of Business Incubators in promoting Entrepreneurship? (14 marks)

OR

Q. No .4 Define Market and explain all the components of Market analysis with suitable examples? (14 marks)

Q. No.5 Describe the major functions of following Central Government's Institutes for promoting entrepreneurship in India: KVIC, EDII, IDBI and IFCI? (14 marks)

OR

Q. No.5 State the importance of Entrepreneurial Development Programmes (EDPs) and explain all the stages involved in structuring the EDPs to meet their objectives? (14 marks)

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE 724A — **Max Time: 3 hrs**
Course Title: GROUND IMPROVEMENT TECHNIQUES — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Densification
(b) Grid Rollers
(c) Mechanical Stabilization
(d) Grouting in Soil
(e) Soil Stabilization
(f) Compressibility
(g) Stone Columns

PART –II

Q. No.2 Explain the classification of ground improvement techniques.

OR

Q. No.2(a) Briefly explain the principle of compaction with field procedure.

(b) What are the quality control requirements in the field under compaction method?

Q. No.3 (a)Explain the vibro-flotation and compaction pile techniques in detail with neat sketches.

(b)What do understand by vibro-compaction and dynamic compaction for ground improvement in granular soil? Discuss in detail with neat sketches.

OR

Q. No 3 What do you understand by drains? Explain different types of drains. What do you mean by vertical and radial consolidation? Discuss in detail with neat sketches.

Q. No.4 Explain various grouting techniques used for ground improvement along with the type of materials used. Write down the mechanics of lime-soil interaction.

OR

Q. No .4(a) Briefly explain soil-cement stabilization and fly ash-lime stabilization methods with construction steps involved.

(b) Explain soil-bitumen stabilization method of construction technique. Also, explain construction steps involved along with proportioning, materials used, equipments, etc.

Q. No.5(a)What do mean by soil-reinforcement technique? Explain the columns formed in-situ with thermal methods involved in.

(b)Write down the applications of soil-reinforcement in ground improvement technique.

OR

Q. No.5 What are geosynthetics? Explain different types of geosynthetics. Write down their properties, functions and applications in detail.

Central University of Haryana
V Semester Term End Examination December 2022
B.Tech. Programmes
Branch: CIVIL ENGINEERING

Course Code: BT CE 342 A
Course Title: Building Construction

Max Time: 03 Hrs
Max Marks: 70

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART - I

Q1. Answer the following: (2 X 7 = 14)

a) Explain pointing.
b) Pictorially show bats used in brick masonry.
c) Write a short note on double scaffolding.
d) Discuss the causes of dampness in structures.
e) Write short note on ventilators.
f) Write a short note on reinforced brick masonry.
g) Explain Fire resistant construction.

PART - II

Q2. (a) What is Shallow Foundation? Discuss different types of shallow foundations with neat sketches. (2 X 7) = 14 Marks

(b) Discuss different types of walls in context of a building.

OR

(i) Write short notes on: Safe Bearing Capacity of soil, Pile foundation, Grillage Foundation.
(ii) Explain Deep Foundations. Further discuss different types of deep foundations with neat diagrams

Q3. (a) Explain Brick Masonry. Further discuss different types of bonds in brick masonry with the help of neat sketches. (2 X 7) = 14 Marks
(b) What is shoring? Discuss how shoring is different from other temporary structures.

OR

(i) Write short notes on: Lintels, Toothing, Perpends, Wall ties.

(ii) What is a staircase? Discuss the requirements of a good staircase in a building.

Q4. (a) Highlight the utility of doors and windows in a building. Also, with the help of neat sketch illustrate different parts of doors. (2 X 7) = 14 Marks

(b) What is a Dampness in a building? Discuss the techniques for prevention of dampness in a building.

OR

(i) Explain different criteria for selection of a flooring material.

(ii) List out the objectives of proving finishes in a building. Further briefly discuss different types of building finishes.

Q5. (a) Discuss the utility of temporary structures? Further discuss different types of formwork. (2 X 7) =14 Marks

(b) Write a short note on: Sound Insulation, Fire Insulation.

OR

(i) Explain the purpose of foundation in a building. Further differentiate between shallow and deep foundations.

(ii) List out the precautions to be taken while applying various dampness prevention techniques. Further discuss the effects of dampness in a building.

Central University of Haryana
Semester Term End Examination December 2022
B.Tech. (Civil Engineering)

Course Code: BTCE 702A
Course Title: Earthquake Engineering

Max Time: 3 Hours
Max Marks: 70

Instructions:
Question Number one **(PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers **(PART-II)** 2 (two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a) Explain the term: i) Seismograph ii) Seismogram
(b) A vibrating system consisting of a mass of 50 kg and a spring of stiffness 4×10^4 N/m is viscously damped. The ratio of two consecutive amplitudes is 20:18. Determine the natural frequency of undamped system.
(c) What are the classifications of Earthquake?
(d) What is P-delta effect?
(e) Why staircase in building attract high lateral force during earthquake? What is the solution?
(f) Explain the concept of Capacity Based Design.
(g) Describe the ultrasonic pulse velocity method.

PART –II

Q. No.2 i) What are different types of Seismic Waves? Explain them with diagrams.
ii) What do you understand by term Earthquake Magnitude? Explain.

OR

Q. No.2 i) What do you understand by term Earthquake Intensity and Intensity Scales? Explain.
ii) Briefly explain the different types of plate margins with examples.

Q. No.3 Derive expression for response of a undamped SDOF system subjected to free vibration.

OR

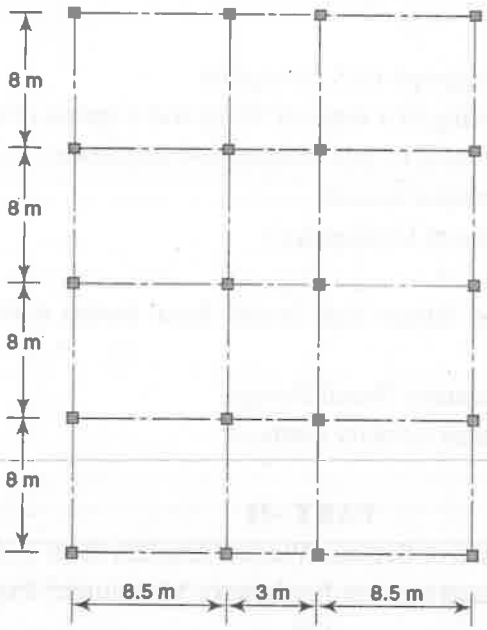
Q. No 3 i) An SDOF system consists of a mass with weight of 175 kg and a spring constant, k = 530 kN/m. While testing the system a relative velocity of 30 cm/s was observed on application of a force of 450 N. Determine the damping ratio, damped frequency of vibration, logarithmic decrement, and the ratio of two consecutive amplitudes.

ii) Derive the expression for logarithmic decrement for damped free vibration of SDOF for (a) Two successive cycles (b) Two cycles of N cycle apart

Q. No.4 Explain various types of vertical and horizontal Irregularities in RCC Buildings with the help of diagrams.

OR

Q. No .4 Plan of a four-storey RCC building is shown in Figure. Dead load including self-weight of slab, finishes, etc. can be assumed as 3 kN/m^2 and live load as 3 kN/m^2 on each floor. Determine the lateral forces and shears at different storey levels. Assuming z = 0.24, I = 1, R = 5, soil type = Medium, storey height = 3.0 m.



Q. No.5 What are principles of Earthquake Resistant Design? Explain briefly.

OR

Q. No.5 What do you understand by Seismic Vulnerability Assessment? Explain various methods in detail.

Central University of Haryana
VII Semester Term End Examination December 2022
B.Tech. Programmes
Branch: CIVIL ENGINEERING

Course Code: BTCE701A **Max Time: 3 hours**
Course Title: Design of Hydraulic Structures

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1

(a)	What is the function of silt excluder?	(2)
(b)	What is the difference between Aqueduct and syphon aqueduct?	(2)
(c)	What are the various considerations according to which location of fall is decided?	(2)
(d)	What would be effect of crack on uplift pressure in Gravity dam?	(2)
(e)	What is phreatic line?	(2)
(f)	What are the essential requirements of spillway?	(2)
(g)	What are the different types of Hydraulic Jumps, explain with the help of Froude number.	(2)

PART –II

Q. No.2(a) Draw a neat layout of Diversion head works and indicate the various components of the system. (7)

Q. No.2(b) Explain Bligh Creep theory in detail and explain floor thickness with the help of neat sketch. (7)

OR

Q. No.2 Design a syhpon aqueduct for the following data:

i.	Discharge of the canal	=	30 Cumec
ii.	Bed width of the canal	=	20 m
iii.	Depth of water in the canal	=	1.6m
iv.	Bed level of the canal	=	260 m
v.	High flood discharge of the drain	=	450 cumec
vi.	High Floor level of the drain	=	261 m
vii.	Bed level f the drain	=	258 m
viii.	General ground level	=	260 m
ix.	Silt Factor	=	1

(14)

Q. No.3 Design a Sarda type Fall for the following data:

Full supply Discharge	:	$\frac{U/S}{D/S}$ = 45 cumec
Full supply Level	:	$\frac{U/S}{D/S} = \frac{118.30m}{116.80m}$
Bed width	:	$\frac{U/S}{D/S}$ = 1.8 m
Bed Level	:	$\frac{U/S}{D/S} = \frac{116.5m}{115.0m}$
Bed width	:	$\frac{U/S}{D/S}$ = 28 m
Drop	:	1.5 m

(14)

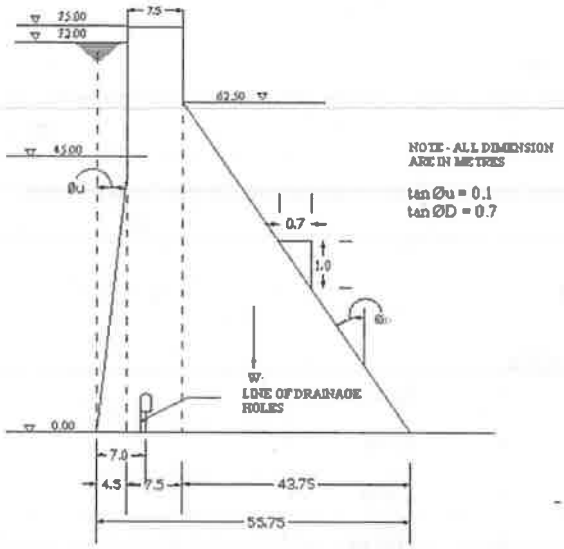
OR

Q. No.3(a) What are the different types of fall structures? Explain in detail with the help of neat sketch. (7)

Q. No.3(b) Wite down design procedure of Cistern element and what are the roughening devices used. (7)

Q. No.4 . For reservoir full condition estimate stresses at the hell and toe of the dam section. Consider weight of dam, water pressure and uplift pressure only.

(14)



OR

Q. No.4(a) Show that the most economical central angle of an arch dam based on thin cylinder theory. (7)

Q. No.4(b) What are the design principles for the of earth dam? Explain with the help of neat sketch. (7)

Q. No.5 Design an ogee spillway with the following data:

Average river bed level	=	100m
RL of spillway crest	=	200 m
Design discharge	=	6500 cumecs
Number of spans	=	5
Clear distance between the piers	=	9 m
Thickness of pier	=	2m
Slope of d/s face of overflow section	=	0.75:1

Kp = 0.01 and Ka = 0.1

Assume suitable data if required. (14)

OR

Q. No.5(a) Discuss the various types of energy dissipation devices used below spillways in relation to the position of Tail Water Rating Curve (TWRC) and Jump Height Curve (JHC). (7)

Q. No.5(b) What type of USBR and I.S. stilling basins will be provided if Fr. No. is greater than 4.5. (7)

Central University of Haryana
V/VII & Re-Appear VI Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Electrical Engineering

Course Code:BT EE505A — **Max Time:3Hrs**
Course Title: Electromagnetic Fields — **Max Marks: 70**

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice.

PART -I

Q. No.1
(a) Consider a cylinder of length L and radius R. Obtain its volume by integration ?
(b) Determine the electric field E at the origin due to a point charge of 54.9nC located at (-4, 5, 3) m in cartesian co-ordinates ?
(c) What is electric flux? Explain the concept of electric flux density?
(d) Define current density. Write the relation between current and current density?
(e) Write the expression for Lorentz force equation and write its significance.
(f) What is a magnetic dipole? How it is differ from electric dipole?
(g) Write the integral and point forms of Faraday's laws.

PART –II

Q. No.2 (a) Determine the electric field intensity due to infinite line charge, at a point perpendicular to its plane and at a given distance from the line charge from first principles.
(b) Find the electric field at distance 'z' above the center of a flat circular disc of radius 'r', which carries a uniform surface charge. (7+7)

OR

Q. No 2.(a) Derive the Relationship between electric field and electric potential.
(b) A Charge of -0.3 μC is located at A(25, -30, 15) (in cm) and a second charge of 0.5 μC is at B(-10, 8, 12) cm. Find E at (i) the origin (ii) P(15, 20, 50) cm. (7+7)

Q. No.3 (a) Explain different types of polarization.
(b) Find the maximum charge that can be held on the isolated sphere 2m diameter, the sphere being in air with dielectric strength 40 kV/cm. What would be the maximum charge if this sphere were in oil of r = 3.5 and dielectric strength of 75 kV/cm. (7+7)

OR

Q. No 3.(a) What is meant by electric dipole? Derive the expression for electric field intensity due to electric dipole.
(b) Two dipoles with dipole moments -5 az nC/m and 9 az nC/m are located at points (0, 0, -2) and (0, 0, 3) respectively. Find the potential at the origin.(a) Derive the integral form of continuity equation and also write its meaning? (7+7)

Q. No.4 (a) A filamentary current of 15A is directed in from infinity to the origin on the positive x axis and then back out to infinity along the position y-axis. Use the Biot-Savart's law of find H at P (0, 0, 1)?

(b) Find the magnetic field intensity at centre of a square of sides equal to 5m and carrying a current equal to 10 A. (7+7)

OR

Q. No 4.(a) State Ampere's circuital law and explain any two applications of Ampere's Circuital law.

(b) Obtain the expression for magnetic field intensity due to infinite long straight carrying a steady current I. (7+7)

Q. No.5 (a) State the Poynting Theorem and derive the necessary expressions.

(b) Explain the concept of displacement current and obtain an expression for the Displacement current density. (7+7)

OR

Q. No.5 (a) Explain (i) Conduction Current. (ii) Displacement current.

(b) Derive the Maxwell's four equations for time varying fields (7+7)

Central University of Haryana
V/VII & Re-Appear VI Semester Term End Examination December 2022
B.Tech. Programmes
Branch: Civil Engineering

Course Code: BT CE-721A **Max Time: 3 hrs.**
Course Title: Design of Concrete Structures-II

Instructions:
Question Number **one (PART-I)** is compulsory and carries total 14 marks (Each sub-Question carries two Marks).
Question Numbers 2(two) to 5(five) carry fourteen marks each with internal choice. If a question has 3 subparts worth 7 marks each, you can attempt any two-part from the three provided, earning 14 marks in total.
Use of calculator and the required IS code approved by the concerned authority is permitted.

PART -I

Q. No.1

(a). Define riser and tread. According to IS code provision, write the range of Riser and Tread
(b). Define Shear key in retaining wall. According to failure criteria, describe their function.
(c). List the different types of water tanks. Explain their significance also.
(d). Write the different stability criteria of a cantilever retaining wall.
(e). What do you mean by curved beam? Explain briefly their uses.
(f). Define Counterfort retaining wall and Buttress retaining wall. Write the difference between these two.
(g). Define the following terms:

I. (a) Flat Slab (b) Panel
II. (c) Column Head (d) Drop

PART –II

Q. No.2 Design the interior panel of a flat slab with drops for an office floor to suit the following data:

Size of office floor=25m x 25m
Size of panels=5m x 5m
Loading class=4 kN/m^2

Materials:
M20 grade concrete
Fe415 steel

OR

Q. No.2 Design a dog legged staircase for a residential building hall measuring 2.2 m × 4.7 m. The width of the landing is 1 m. The distance between floor to floor is 3.3 m. The weight of the floor finish is 1kN/m^2. The materials used are M20 grade concrete and Fe 415 steel. Sketch the details of steel. Take flight spans longitudinally.

Q. No.3 A circular RC girder bridge for the raft foundation of a water tank tower has a diameter of 10m. The factored U.D.L transmitted by 8 symmetrically placed column on girder being 300 kn/m. The width of beam is 500m and overall depth is 100mm.Using M20 grade concrete and Fe 415 steel design suitable reinforcement in circular girder and sketch the reinforcement details of critical sections.

OR

Q. No 3 Design a cantilever retaining wall to retain earth 3.5 m high backfill above ground level. The density of earth is 17 kn/m3 and its angle of internal friction is 30 degrees. The earth is horizontal at top. The safe bearing capacity of soil is 180 KN/m^2 and coefficient of friction between soil and concrete is 0.55. Use M20 concrete and Fe415 steel.

Q. No.4 Design a rectangular water tank resting on ground having base area of 6m × 4m. The height of water tank is 3.75 m and keep a free board of 0.15m. Use M25 concrete and Fe 415 steel. Assume appropriate data and clearly state the assumptions.

OR

Q. No .4 Write the Design Philosophy and requirements of Water Tank? Also write the design steps of Cylindrical/ Circular Water Tanks?

Q. No.5 (2X7=14)

a) What do you mean by Yield Line Theory? What are the various methods of designing slabs by Yield Line theory? (7 marks)

b) Write all the assumptions of Yield Line theory and explain their significance also? (7 marks)

c) Design a simply supported square slab of side 4 m to support a service load of 4 kn/m^2. Use M20 concrete and Fe 415 steel. (7 marks).