CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations Jul 2023

Programme: M.Tech(CSE) | **Session: 2022-23**

Semester: 2nd | **Max. Time: 3 Hours**

Course Title: Machine Learning | **Max. Marks: 70**

Course Code: MT CS 201

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 student need to answer any two parts of each question. Each part carries seven marks.

<table>
<tr><td>Q1</td><td></td><td></td><td>(4X3.5=14)</td></tr>
<tr><td></td><td>A</td><td colspan="2">State Bayes theorem.</td></tr>
<tr><td></td><td>B</td><td colspan="2">What is independent component analysis.</td></tr>
<tr><td></td><td>C</td><td colspan="2">How to use entropy as evaluation function?</td></tr>
<tr><td></td><td>D</td><td colspan="2">Differentiate between training data and testing data.</td></tr>
<tr><td></td><td>E</td><td colspan="2">What is the essential difference between analytical and inductive learning methods?</td></tr>
<tr><td></td><td>F</td><td colspan="2">How to compute expected value and variance of a random variable?</td></tr>
<tr><td></td><td>G</td><td colspan="2">List the basic design issues in machine learning.</td></tr>
<tr><td>Q2</td><td></td><td></td><td>(2X7=14)</td></tr>
<tr><td></td><td>A</td><td colspan="2">Define Machine learning? Explain the types of machine learning with example.</td></tr>
<tr><td></td><td>B</td><td colspan="2">The values of independent variable x and dependent value y are given below:
<table><tr><th>X</th><th>Y</th></tr><tr><td>0</td><td>2</td></tr><tr><td>1</td><td>3</td></tr><tr><td>2</td><td>5</td></tr><tr><td>3</td><td>4</td></tr><tr><td>4</td><td>6</td></tr></table>
Find the least square regression line $y=ax+b$. Estimate the value of y when x is 10.</td></tr>
<tr><td></td><td>C</td><td colspan="2">Discuss the significance of Generalized Linear Models with example.</td></tr>
<tr><td>Q3</td><td></td><td></td><td>(2X7=14)</td></tr>
<tr><td></td><td>A</td><td colspan="2">(i) Explain the features of Bayesian learning methods.
(ii) Distinguish between inductive bias and estimation bias.</td></tr>
<tr><td></td><td>B</td><td colspan="2">What is the role of radial basis function i separating nonlinear patterns.</td></tr>
<tr><td></td><td>C</td><td colspan="2">Discuss how a multi-layer network learns using a gradient descent algorithm.</td></tr>
<tr><td>Q4</td><td></td><td></td><td>(2X7=14)</td></tr>
<tr><td></td><td>A</td><td colspan="2">Explain Principle Component Analysis for dimensionality reduction.</td></tr>
<tr><td></td><td>B</td><td colspan="2">What are the requirements of clustering algorithms? Discuss k-means clustering algorithm.</td></tr>
<tr><td></td><td>C</td><td colspan="2">Write and explain Bellman equation. Discuss its significance in Reinforcement learning.</td></tr>
<tr><td>Q5</td><td></td><td></td><td>(2X7=14)</td></tr>
<tr><td></td><td>A</td><td colspan="2">With suitable example discuss a radial basis function network.</td></tr>
<tr><td></td><td>B</td><td colspan="2">Explain appropriate problem for Neural Network Learning with its characteristics.</td></tr>
<tr><td></td><td>C</td><td colspan="2">Write a short note on following:
(i) Markov decision processes
(ii) Back propagation algorithm</td></tr>
</table>

CENTRAL UNIVERSITY OF HARYANA

Second Semester Term End Examinations July 2023

Programme: M.Tech **Session: 2022-23**

Semester: 2nd **Max. Time: 3 Hours**

Course Title: Cloud Computing **Max. Marks: 70**

Course Code: MT CS 209

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) Discuss the criteria which are satisfied by the distributed system environment.

b) Write all the essential characteristics of cloud computing.

c) Compare Virtual Appliance and Virtual Machine.

d) Write about Hardware Assisted Virtualization technique.

e) Explain Identity management in cloud security.

f) Why availability and trust is important for Cloud service providers while participating in federation.

g) Write about the Eucalyptus cloud platform.

Q 2. (2X7=14)

a) Explain all the distinct dimensions that the Cloud Cube Model identifies.

b) Discuss the cloud architecture that covers the entire stack, from hardware appliances to software systems.

c) Discuss the Secure Shell protocol in detail.

Q3. (2X7=14)

a) VMMs use binary translation techniques to implement virtualization. Discuss it in detail.

b) Explain Dual Mode Systems that ensure an incorrect (or malicious) program cannot cause other programs—or the operating system itself—to execute incorrectly.

c) Discuss Xen hypervisor in detail. Also use proper diagrams to explain its architecture.

Q 4. (2X7=14)

a) Compare cloud services of Amazon Ec2 and Google App Engine.

b) Cloud services must be capable of protecting against the top threats to cloud security. In this regard discuss some important security concerns.

c) Securing data which is sent to, received from, and stored in the cloud is the single largest security concern that most organizations have with cloud computing. In this regard explain the key mechanisms for protecting cloud data.

Q 5. (2X7=14)

a) Discuss different services that are provided by Microsoft Azure.

b) What is cloud federation? Explain why cloud federation is needed. Also write the advantages obtained by CSPs in the federation.

c) When is the Coalition formation game classified as a Hedonic game? Also discuss transferable utility and non-transferable utility.

Central University of Haryana
II Semester Term End Examination, June/July 2023
M.Tech. Programme
Branch: Computer Science and Engineering

Course Code: MT CS 207 Max Time: 3 Hours
Course Title: Cyber 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

(a) What is cryptography? (2 marks)

(b) Differentiate between symmetric and asymmetric cryptography. (2 marks)

(c) What is Elliptic curve? (2 marks)

(d) Name any 4 security protocols in real life with example. (2 marks)

(e) What is identity based encryption? (2 marks)

(f) What do you mean by e-mail security? (2 marks)

(g) Differentiate between e-commerce and e-business. (2 marks)

PART –II

Q. No. 2 What is digital signature? Why to use this? How it works, explain with diagram

OR

Q. No. 2 Discuss about Advanced Encryption Standard (AES) with example.

(14 marks)

Q. No. 3 Explain Elliptic Curve Digital Signature Algorithm (ECDSA) with example.

OR

Q. No. 3 Describe Elliptic Curve PKI.

(14 marks)

Q. No. 4 What is pairing based cryptography?

OR

Q. No. 4 What is identity based encryption and attribute based encryption?

(14 marks)

Q. No. 5 Explain PGP and S-MIME.

OR

Q. No. 5 How cloud security is achieved through PKI?

(14 marks)

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations Jun 2023

Programme:	M.Tech (Energy System and Management)	**Session: 2022-23**
Semester:	2nd	**Max. Time: 3 Hours**
Course Title:	Solar Thermal Technologies and applications	**Max. Marks: 70**
Course Code:	**MTESM-202**	

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries 3.5 Marks.

2. Question no. 2 to 5 have three parts and students need to answer any two parts of each question. Each part carries six marks.

Q 1. (4X3.5=14)

a) What is solar constant? Explain briefly.

b) Define the terms: (i) Clarity index, (ii) Concentration ratio.

c) What is a concentrating collector?

d) Define 'solar thermal energy'.

e) Why is there a need of orientation in concentrating collectors?

f) What is the function of an 'energy storage system'?

g) What is "Solar pond"?

Q 2. (2X7=14)

a) Explain the flat plate collector working principle, types and characteristics.
b) Explain the types of solar selective coatings in details
c) What is flat plate collector and its operation and uses of flat plate solar collector?

Q3. (2X7=14)

a) Describe the cylindrical parabolic concentrating collector and performance analysis of cylindrical parabolic concentrating collector.

b) Write a review on thermal analysis of concentrating collectors in a solar system.

c) Differentiate the advantages and disadvantages of concentrating collectors.

Q 4. (2X7=14)

a) Design and development of Solar Stirling Engine for power generation.
b) Explain the Construction and working principle of solar power plant.
c) What is the function of a parabolic trough and how solar energy is harvested using parabolic trough?

Q 5. (2X7=14)

a) Analysis method for the design of thermal energy storage system.

b) Explain the economic parity of solar for industrial process heat.

c) Explain the Solar thermal energy storage and its types.

CENTRAL UNIVERSITY OF HARYANA

Term End Examinations July 2023

Programme: M.Tech. (Energy Systems and Management) **Session: 2022-23**

Semester: 2nd **Max. Time: 3 Hours**

Course Title: Management of Rural Energy System **Max. Marks: 70**

Course Code: MTESM-201

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 is meant by Electric load survey?

b) What are the basic attributes of Rural Energy Management Systems?

c) What is meant by Profiling of Transmission Lines?

d) Present a comparative analysis of the properties of different conductors?

e) Discuss the functioning of insulator?

f) Explain fault phenomenon in power network?

g) Explain the coordination between telecommunication lines?

Q 2. (2X7=14)

a) Enumerate different methods of Forecasting and discuss one of them in detail?

b) Explain in brief the methodology to choose appropriate conductor for transmission?

c) Derive the expression for Line to Ground Fault and Draw the neat sketch for each sequence?

Q3. (2X7=14)

a) Explain in brief operation and construction of string type insulator?

b) Discuss the factors affecting the sag in overhead line?

c) Derive the expression for calculation of sag and Swell in overhead transmission lines?

Q 4. (2X7=14)

a) Present a case study of a typical transmission system design with the help of block diagrams?

b) Present a comparative analysis of different load flow methods discuss merits and demerits?

c) Explain the concept of string efficiency and derive the expression?

Q 5. (2X7=14)

a) Explain Double line to ground fault in detail derive the sequence circuits?

b) Discuss the encoding steps of newton raphson method of load flow analysis?

c) Explain planning and selection parameters for substations for rural networks?

Central University of Haryana
ODD Semester Term End Examination June-July 2023
M.Tech. Programmes
Branch: Energy System and Management (Electrical Engg.)

Course Code: MTESM-207 **Max Time: 3h**
Course Title: Electric and Hybrid Vehicle **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 Hybrid traction.
(b) Draw the performance characteristics of an electric motor for traction.
(c) Define Time ratio Control (TRC).
(d) What are the disadvantages of the BLDC motor drive?
(e) Define SOC.
(f) How to select energy technology in Hybrid vehicle?
(g) Classify the control techniques of Permanent Magnet AC Motors (PMSM).

PART –II

Q. No.2 What are the social and environmental impoartance of Hybrid and Electric vehicles? Explain the impact of modern drive trains on electric supplies.

OR

Q. No.2 Describe the Electric-Hybrid vehicle performance parameters and derive the mathematical models to analyze the vehicle's performance.

Q. No.3 Explain the architecture of various hybrid drive train topologies in detail.

OR

Q. No 3 Explain the power flow control drive train topologies of the Hybrid vehicles.

Q. No.4 What are the components used in Hybrid and Electric vehicles? Explain the configuration and control techniques of the DC motor drives.

OR

Q. No .4 Explain the configuration and control techniques of Switch Reluctance motor drives and drive system efficiency.

Q. No.5.Write Short note followings:

(a) Energy storage technology
(b) Matching of Electrical machines and Internal Combustion engines (ICE).

OR

Q. No.5 What is energy management? Classify the energy management strategies used in hybrid and electric vehicles and describe implementation issues of these strategies.

Central University of Haryana
2nd Semester End term Exam
M. Tech. (Structural Engineering)
Department: Civil Engineering

Course Code: MTCE 201 **Max Time: 3 hrs.**
Course Title: Advanced Structural Analysis **Max Marks: 70**

Instructions:

1. Question Number **one (PART-I)** is compulsory and carries 14 marks in total (Each PART carries 3.5 Marks). Attempt any 4 questions out of 7.
2. Question Numbers **2(two) to 5(five)** carry 14 marks each with internal choice. Attempt any 2 questions of your choice if question (**from Q2 to Q5**) carries 3 sub-parts of 7 marks each.

PART -I

Q1 Write a short note on following – (3.5×4=14 marks)

a) What are the differences between stiffness and flexibility methods of structural analysis.
b) Explain static indeterminacy and its types. Illustrate with the help of an example.
c) Explain why the stiffness method is preferred by software for structural analysis.
d) Differentiate between global and local co-ordinates.
e) Explain indeterminacy of a structure and its relation with the stability of structure.
f) Why flexibility and stiffness methods are known as Force and Displacement method respectively? Explain briefly.

PART –II

Q2 (a) "Matrix methods are dependent on Indeterminacy of a structure" Discuss this statement with the suitable example. **(07 marks)**

(b) Discuss the practical applications of matrix methods and their role in computer programming? **(07 Marks)**

(c)Write down the steps used to derive the flexibility matrix of a portal frame. **(07 marks)**

Q3 Analyze the following truss by flexibility matrix method (Fig. 1). AE is constant for all members. **(14 marks)**

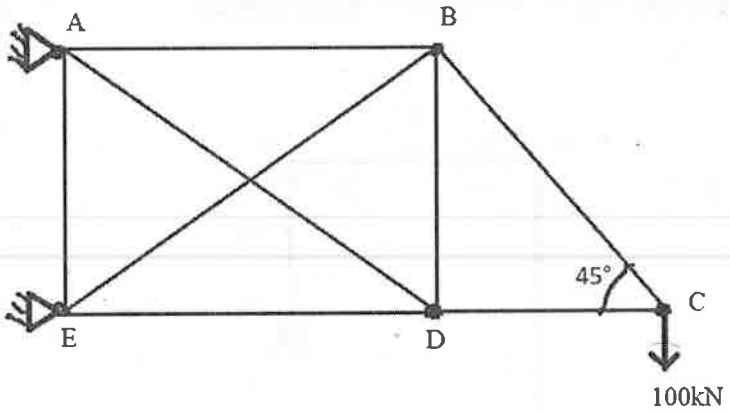

Fig. 1

OR

Q3 Analyze the Beam given in Fig. 2 by stiffness matrix method. Take EI=constant throughout the span. **(14 marks)**

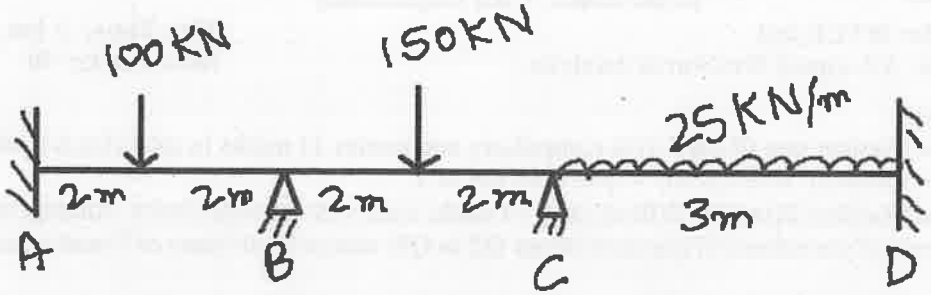

Fig. 2

Q4 Analyze the portal frame using stiffness matrix (Fig.3). Neglect axial deformations in columns. **(14 Marks)**

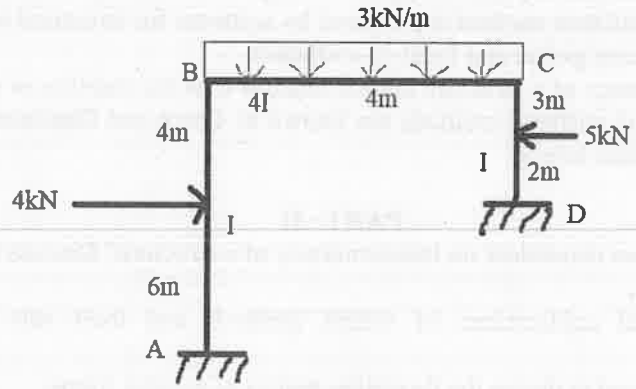

Fig. 3

OR

Q4 Analyze the portal frame (Fig. 4) by Flexibility matrix method. **(14 marks)**

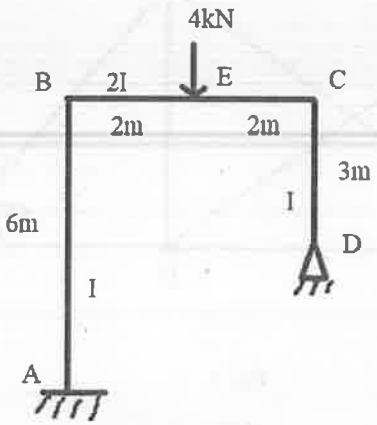

Fig. 4

Q5 (a) Formulate the stiffness matrix of a beam of span L, flexural rigidity EI, subjected to load 'P' acting at mid-span (Fig. 5) **(07 marks)**

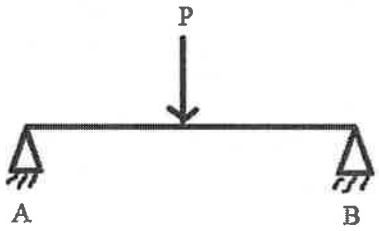

Fig. 5

(b) What are coordinate systems and their types. Explain with the help of neat sketches. **(07 marks)**

(c) Construct the Stiffness matrix of continuous beam (Fig. 6). Take EI as constant throughout the span. **(07 Marks)**

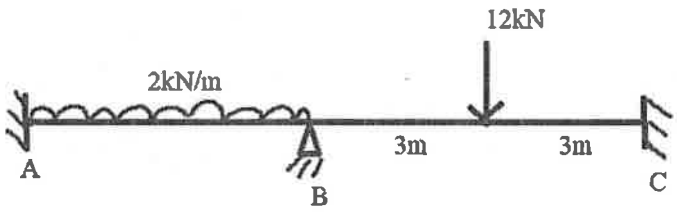

Fig.6

Central University of Haryana
2nd Semester End term Exam
M. Tech. (Structural Engineering)
Department: Civil Engineering

Course Code: MTCE 203 **Max Time: 3 hrs.**
Course Title: Advanced Concrete Technology **Max Marks: 70**

Instructions:

1. Question Number **one (PART-I)** is compulsory and carries 14 marks in total (Each PART carries 3.5 Marks). Attempt any 4 questions out of 7.
2. Question Numbers **2(two) to 5(five)** carry 14 marks each with internal choice. Attempt any 2 questions of your choice if question (**from Q2 to Q5**) carries 3 sub-parts of 7 marks each.

PART -I

Q1 Write a short note on following – **(3.5×4=14 marks)**

a) What are super-plasticizers and their role. Discuss with examples.
b) What do you understand by bulking of aggregates. Illustrate with the help of real-life example.
c) Explain green building materials and their types.
d) Explain alkali-aggregate reaction.
e) Explain prestressed concrete.
f) Explain the role of air entrainers. Illustrate with the help of examples.

PART –II

Q2 (a) Explain the following: **(07 marks)**
i. Geosynthetics
ii. Geopolymers

(b) Write a note on: **(07 Marks)**
i. Ferrocement
ii. Special mortars

(c)What are admixtures, their role and types. **(07 marks)**

Q3 Explain in detail processes of manufacture of concrete e.g., batching, mixing etc. **(14 marks)**

OR

Q3. Explain creep and shrinkage of concrete. Also discuss the factors effecting creep. **(14 marks)**

Q4 Discuss: **(14 Marks)**
i. Pumping of concrete
ii. Grouting and mass concreting operations

OR

Q4 Discuss construction methods for: **(14 marks)**
i. High rise construction
ii. Construction in marine environments

Q5 (a) Discuss underwater concreting with the help of neat sketch **(07 marks)**
(b) Explain about self-compacting concrete and fibre reinforced concrete. **(07 marks)**
(c) Explain non-destructive testing methods on concrete. **(07 marks)**

CENTRAL UNIVERSITY OF HARYANA

Second Semester Term End Examinations June 2023

Programme: M.Tech (Civil) Structural Engineering

Session: 2022-23

Semester: 2nd Semester **Max. Time: 3 Hours**

Course Title: Design of Bridges **Max. Marks: 70**

Course Code: MTCE211

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.
3. Use of **IRC: 5-1998, IRC: 6-2000, IRC: 112-2011,** and **IS: 456-2000** is allowed in the examination. Use of **Pigeaud's Design Charts, Steel tables and Graphs** is allowed in the examination. Assume any missing data suitably.

Q 1. (4X3.5=14)

a) What are the various types of bridges being used in India and elsewhere? What are the criteria for adopting a particular type in certain situation?
b) Name the different type of load used for designing a bridge. What are the factors on which the selections of a loading type depend?
c) Discuss the provision made for Secondary stresses as per IRC: 6-2000.
d) Describe the criteria for limiting value of deflection in bridge deck slab as per IRC: 112-2011 and IS: 456-2000.
e) Briefly explain the necessity of using Abutments.
f) Describe the material used for construction of Piers and Abutments.
g) Discuss the various different types of deep foundation adopted for bridges. Explain any one of them.

Q 2. (2X7=14)

a) Describe briefly the load characteristics of IRC Class AA and IRC Class 70 R wheeled and Tracked vehicle loading with neat and clean sketch
b) What is the essential information required to be collected for the design of the bridge? Discuss briefly the characteristics of an ideal site for a bridge.
c) What do you mean by Economical span? Derive an equation for the economical span of bridge stating clearly the assumption made in derivation.

Q3. (2X7=14)

a) Design a solid slab bridge for class A loading for the following data by effective width method: Clear span = 4.5m; Clear width of roadways = 7m; Average thickness of wearing coat = 80mm. Use M 20 mix. Take unit weight of concrete as 24000 N/m^3
b) Briefly explain the various types of bridge decks slab generally adopted in different types of high way bridges.
c) With the help of Pigeaud's Curves find out the dispersion of wheel load for wearing coat only, dispersion of wheel load through wearing coat and structural slab at 45°, dispersion of wheel load through wearing coat and structural slab at 85.9° for the following data: IRC Class A wheel load= W= 57 kN; wheel contact dimensions= 500mm by 250mm; Thickness of wearing coat = D= 80 mm; Thickness of Structural Slab =H= 200 mm; Dimension of slab: L =4m and B=2m, Poisson's ratio= μ= 0.15

Q 4. (2X7=14)

a) Estimate the different quantity like Weight of vertical side walls, Soil pressure, uniform lateral pressure due to effect of superimposed dead load and live surcharge, uniform lateral pressure due to effect of superimposed dead load surcharge only and intensity of water pressure for a reinforced box culverts having a clear vent way of 3m*3 m. the superimposed dead load on the culvert is 12.8 kN/m^2. The live load is estimated is 50 kN/m^2. Density of soil at site is 18 kN/m^3. Angle of repose is 30°. Adopt M-20 grade concrete and Fe 415 HYSD bars.

b) What do you mean by T- Beam Bridges? Discuss the COURBON'S Method for the distribution of load among the girder.

c) Briefly discuss the typical structural elements of a reinforced concrete T beam and slab bridge deck and their function. Under what situation you would prefer to adopt reinforced concrete T beam and slab bridge deck for highway crossing.

Q 5. (2X7=14)

a) Describe with sketches the types of piers used for R.C.C bridges. List the various forces acting on pier. How do you evaluate these forces?

b) Define bearing. Discuss the main function of bearing used in bridge structures.

c) A Pier shown in fig 1 supports the deck forming a major highway. The various forces acting on the Pier are listed below:

a) Dead load from each span = 2000 kN

b) Reaction due to Live load on one span = 1000 kN

c) Braking forces = 140 kN

d) Wind pressure on Pier = 2.4 kN.m^2

e) Material of Pier = 1:3:6 cement concrete

f) Density of Concrete = 24 kN/m^3

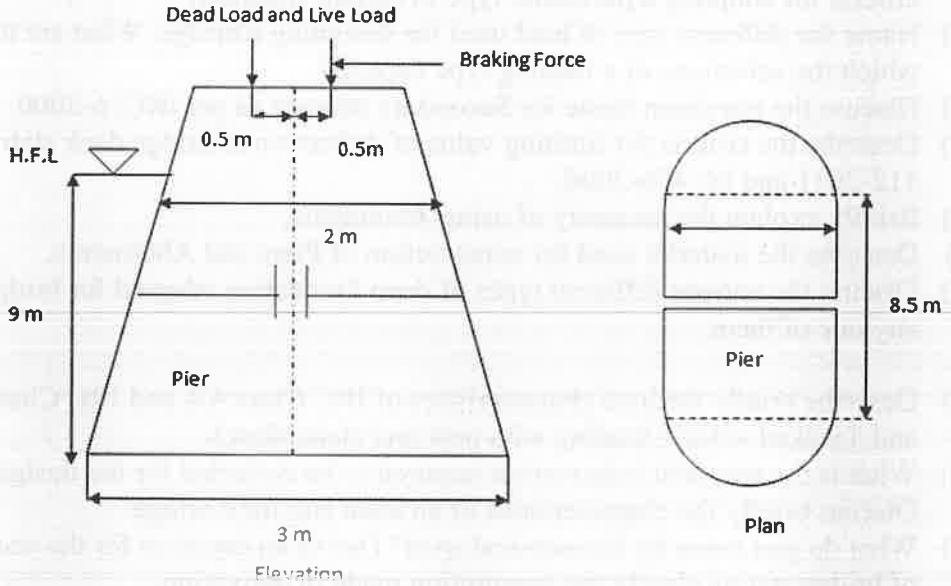

Fig.No.1

Calculate the stress developed at the base of the Pier due to the following cases: **1)** Dead load and self weight of the Pier; **2)** Effect of buoyancy **3)** Due to eccentricity of live load; **4)** Due to longitudinal braking forces. Also estimate the maximum and minimum stresses developed at the base of the Pier due to critical combination of the various loads.

CENTRAL UNIVERSITY OF HARYANA

Semester Term End Examinations July 2023

Programme: M.Tech (Structural Engineering) **Session: 2022-23**
Semester: Second Semester **Max. Time: 3 Hours**
Course Title: Structural Dynamics **Max. Marks: 70**
Course Code: MTCE 202

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. (3.5 X 4=14)

a) What are the classifications of Earthquake?

b) Explain the concept of torsional irregularity in hill buildings.

c) Explain Duhamel's Integral?

d) Why staircase in building attract high lateral force during earthquake? What is the solution?

e) What are the principles of earthquake-resistant design of RC buildings?

f) Explain the short column effects in RCC buildings.

g) Describe the various Partial destructive tests.

Q 2. (2X7=14)

a) How an earthquake occurs? Briefly explain the different types of plate margins with examples.

b) Derive expression for response of a SDOF system subjected to free vibration.

c) 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. Also determine the damping ratio and damped natural frequency.

Q3. (2X7=14)

a) In an experiment on a certain structure modelled as an SDOF system, the amplitude of free vibration decreased from 10 mm to 4 mm. If the logarithmic decrement was 0.1018 and undamped natural frequency is 40 rad/s, determine the damping ratio, damped period, and number of cycles completed

b) Derive the expression for logarithmic decrement for damped free vibration of SDOF for (a) Two successive cycles (b) Two cycles of N cycle apart

c) The properties mass m, stiffness k, and natural frequency ω of an undamped SDOF system are to be determined by a harmonic excitation test. At an excitation frequency of 4 Hz the response tends to increase without bound. Then, a weight W of 22 N is attached to the mass m, the resonance occurred at 3 Hz. Determine the dynamic properties of the system

Q 4. (2X7=14)

a) What are the local site effects which modifies the ground motion characteristics during an earthquake? Explain them briefly.

b) Explains the effects of Topography on ground motion characteristics.

c) Explain the application of Huygens' principle in diffraction phenomenon.

Q 5. (2X7=14)

a) What are different Non Destructive tests (NDT) and Partial Destructive test (PDT) performed for evaluation of Buildings?

b) Explain various types of architectural Irregularities in RCC Buildings with the help of diagrams.

c) Elaborate the quantitative methods of seismic evaluation of building.

CENTRAL UNIVERSITY OF HARYANA

Second Semester Term End Examinations July 2023

Programme: M.Tech. (Structural Engineering) **Session: 2022-23**

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

Course Title: Earth Retaining Structures **Max. Marks: 70**

Course Code: MT CE 214

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 do you understand by earth pressure on wall? Differentiate between active and passive earth pressure.

b) A cohesive backfill has a cohesion of 14 kN/m^2 and $\phi = 30^o$. The unit weight is 18 kN/m^3 and the height of retaining wall is 4m. What is the depth of tension cracks? Also sketch the distribution of active earth pressure.

c) Explain the method of slices for the stability analysis of finite slopes.

d) What are different types of retaining walls? Discuss in brief with neat sketches.

e) Briefly discuss about the proportioning of the gravity retaining wall.

f) Draw the earth pressure distribution diagram for a retaining wall with (i) submerged backfill (ii) backfill with surcharge load. Assume active earth pressure conditions.

g) What is an anchored sheet pile? Why is it required? Discuss various types of sheet piles in brief.

Q 2. (2x7=14)

a) 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 (γ = 16 kN/m^3), (ii) water table rises upto ground surface (γ_{sat} = 20.5 kN/m^3).

b) With suitable illustration, describe the Culmann's trial wedge method of graphical construction for non-cohesive backfill under active earth pressure conditions.

c) A retaining wall with soft saturated clay backfill is 7 m high. For the undrained condition ($\phi = 0$) of the backfill, determine: (i) the maximum depth of tension crack (ii) the active force before the tension crack occurs, and (iii) the active force after the occurrence of the tension crack. γ = 16 kN/m^3, c_u = 17 kN/m^2.

Q3. (2X7=14)

a) Discuss briefly with neat sketches modes of failure of a retaining wall. Also determine various forces acting on the retaining wall.

b) Differentiate critically the classical earth pressure theories of Rankine and Coulomb.

c) What are the design criteria to be satisfied for the stability of the cantilever retaining wall? Indicate briefly how will you ensure the same.

Q 4. (2X7=14)

a) A cantilever sheet pile retains soil to a height of 6m. Find the depth to which the pile should be driven. Take $\gamma = 18$ kN/m^3 and $\phi = 30^o$. Use approximate method.

b) How do you calculate the depth of embedment of sheet pile in cohesive soil? Briefly discuss step by step procedure and draw the pressure distribution diagram.

c) What is cofferdam? Give classification of cofferdam with neat diagrams.

Q 5. (2X7=14)

a) What do you understand by an earthen dam? Discuss classification of earthen dam with neat diagram.

b) Briefly discuss the stability of earth dam during (i) steady seepage, (ii) end of construction with suitable illustration.

c) Write short notes on: (i) slope protection (b) Taylor's stability number.

CENTRAL UNIVERSITY OF HARYANA

Second Semester Term End Examinations June 2023

Programme: M. Tech **Session: 2022-23**

Semester: Second **Max. Time: 3 Hrs**

Course Title: Disaster Management **Max. Marks: 70**

Course Code: MT AU 102

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 arerequired to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) Given the names of areas prone to flood, avalanches and cyclone in India?

b) What are the structural non structural mitigations of disaster?

c) What are the disaster risks? Describe their concepts and elements?

d) Describe the oil spill with two suitable examples in details?

e) Explain what would be the strategy of survival in the period of disaster?

f) What would be the technique of disaster risk assessment?

g) Give the details account of Bhopal Gas Tragedy?

Q 2. (2X7=14)

a) What is remote sensing? Describe the applications in details?

b) What are the disaster risks: concept and elements, Disaster risk reduction, global and National disaster risk situations?

c) Give brief account of the meaning, concept and strategy of disaster mitigation? Emerging trend in mitigation?

Q3. (2X7=14)

a) How to do disaster management? What could be the possible post disaster action taken by individual and government body discuss in details?

b) What are the landslide and avalanches? Their causes, impact on environment discuss in details?

c) What is earthquake? Causes of earthquake, Seismic waves and seismic zones in Indian scenario discuss in details?

Q 4. (2X7=14)

a) What is volcanism, factors and impact on environment?

b) Define the flood, types and their impact on individual and environment discuss in details?

c) Give the detailed explanation of Man-made and natural disaster and also provide the details of at least two examples for both?

Q 5. (2X7=14)

a) What is the drought define the causes, impact on man and environment explain in details?

b) What is the tsunami, define the causes and impact on environment?

c) Define the disaster, factors and significance, difference between hazard and disaster, nature types and magnitudes of disaster?