CENTRAL UNIVERSITY OF HARYANA

Term End Examinations January 2023

Programme: M.Sc. Biochemistry | **Session: 2022-23**
Semester: III | **Max. Time: 3 Hours**
Course Title: Plant Biochemistry | **Max. Marks: 70**
Course Code: SIAS BC 13 03 C 4004

Instructions:

1. Question no. 1 has seven parts and students are required to answer any four. Each part carries three and a 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. Answers **ANY FOUR** questions. (4X3.5=14)

a) Draw the structure of chloroplast.

b) Explain endosymbiont theory.

c) Write down differences among C3, C4 and CAM metabolism.

d) Write a note on Nodulins.

e) Write short note on coumarins.

f) Define adaptation, avoidance and tolerance against stress in plants.

g) Write a short note on terpenoids.

Q 2. (2X7=14)

a) What are different photosynthetic molecules involved in photosynthesis? describe their properties.

b) Write note on different types of light reactions in photosynthesis.

c) Write down about Hatch-Slack pathway and its variants metabolism and its benefits.

Q3. (2X7=14)

a) Describe Biochemistry of nitrogen fixation, also explain nitrogenase enzyme complex.

b) Describe various steps of nodulation, bacterial attachment and infection in legumes by symbiotic bacteria.

c) Write in details about Ammonia assimilation and transamination in plants.

Q 4. (2X7=14)

a) Describe the various biological roles of plant phenolics.

b) Describe different classes of flavonoids and their functions.

c) Write about different benzoic acid derivatives and their mechanism of function.

Q 5. (2X7=14)

a) Describe the response of plants towards insects and also mention different resistance strategies.

b) Write in details about mechanisms of resistance against abiotic stresses.

c) What are ROS? Write down their damaging role in plants.

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Term End Examinations January 2023

Programme: M.Sc. Biochemistry **Session: 2022-23**

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

Course Title: Clinical Biochemistry **Max. Marks: 70**

Course Code: SIAS BC 1302 C 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 is the difference between serum and plasma? How they are stored?

b) Write a short note on ketone bodies.

c) What are the parameters of quality tests?

d) What are disorders of metabolism? Explain by giving examples

e) Explain the mechanism of pathogenesis of ketone bodies

f) What are the different types of colored sample vials used to collect blood sample?

g) What is bilirubin? Discuss its clinical relevance.

Q 2. (2X7=14)

a) Discuss difference between serum and plasma. What is significance of plasma and serum in clinical biochemistry test?

b) Discuss about various precautions and conditions for collection and preservation of biological fluid specimen.

c) What do you understand from accuracy & precision in diseases diagnosis? How these features are relevant for diseases management?

Q3. (2X7=14)

a) What are disorders of Galactosemia?

b) Explain the mechanism of phenylketonuria and homocystineuria and related disorders.

c) Discuss diagnostic tests and clinical significance of HDL, LDL, triglyceride?

Q 4. (2X7=14)

a) Give a detailed account on respiratory and renal mechanism of acid balance disorders.

b) Define mineral metabolism. Explain various disorders related to mineral metabolism.

c) Discuss the conditions of hypercalcemia, hypocalcemia, and Hyperphosphatemia?

Q 5. (2X7=14)

a) Explain the Kidney and Liver Function Test?

b) Discuss about Inborn errors of metabolism?

c) Discuss disorders of acid base metabolism and their clinical implications

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Term End Examinations January 2023

Programme: M.Sc., (Biochemistry) **Session: 2022-23**

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

Course Title: Cancer Biology **Max. Marks: 70**

Course Code: SIAS BC 13 01 DCEC 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 student need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a. What are the essential features that differentiate normal and cancer cells?

b. Cancer is clonal in origin-Explain the phenomenon of Clonal Expansion

c. What are Carcinogens and what are the various types of carcinogens and give examples

d. What are the myths and misconceptions that is prevailing amongst people about cancer. Explain the ways in which oral cancer is formed.

e. What are the cancer diagnosis and detection methods available? Explain one example.

f. What is Mammography? Where is it utilized. Explain the working principle of it.

g. What is Pheochromocytoma and Wilm's Tumors? Explain the mechanism by which Wilm's tumors are formed.

Q 2.

(a). What is a normal cell cycle and explain the cell cycle regulatory mechanisms with an illustration?

(b). Explain with an example the crucial points at which de-regulatory activities leads to tumorigenesis.

(c). What are the Hallmarks of Cancer? Explain how self-sufficiency of growth signals and Apoptosis have a role in Cancer formation.

Q 3.

(a). What are Oncogenes and tumor Suppressor? What role do they have on cell cycle in cancer induction?

(b). What are Cancer cell Markers and what are their various types of Cancer Cell Markers available. Explain how one can diagnose and detect cancer using Cell Markers.

(c). How do Signal transduction pathways become permanently altered or how do they lead to transformed cells. Explain the steps in the development of Colon Cancer (provide the flowchart or a diagram)

Q 4.

(a). What are the radiological examination methods available to detect and diagnose cancer?

(b). Explain two different methods used to detect and diagnose two different type of Cancer.

(c). Explain the role of computational tools in cancer prediction. What are their efficacy and sensitivity in detection of tumors?

Q. 5.

(a). Immune Cells play a crucial role in eliminating cancer cells. Explain in detail the link between Immune (both humoral and cell-mediated/cellular branch) and cancer cells.

(b). What is Complementary Therapy? How can yoga and medication prevent cancer onset?

(c). What are cancer vaccines? Explain efficiency of cancer vaccines in cancer management by giving a suitable example.

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Term End Examinations- January 2023

Programme: M.Sc. Biochemistry **Session: 2022-23**

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

Course Title: Genomics and Proteomics **Max. Marks: 70**

Course Code: SIAS BC 13 01 C 3104

Instructions:

1. Question no. 1 has 7 parts and students need to answer any 4. Each part carries $3^1/2$ Marks.
2. Question no. 2 to 5 have 3 parts and student need to answer any 2 parts of each question. Each part carries 7 marks.

Q 1. **(4X3.5=14)**

a) Write short notes on performing site directed mutagenesis in laboratory.

b) Write short notes on gene over expression and gene complementation.

c) What are the two prominent promiscuous enzymes used for proximity labelling and their mode of action.

d) Write short notes on using proteomics for drug discovery.

e) Write short notes on gel filtration chromatography.

f) What is Chromosome walking and its importance?

g) Write basic steps involve in the Human genome sequencing.

Q 2. **(2X7=14)**

a) What is CRISPR? Explain the mechanism of CRISPR based gene manipulation techniques.

b) Explain Yeast-2-Hybrid system in detail.

c) What is conditional mutagenesis, explain Cre-lox and Flp-rt systems used for conditional mutagenesis.

Q3. **(2X7=14)**

a) What is centrifugation? Describe various centrifugation techniques used for separation of biomolecules.

b) Define proteome. Give a detailed account on 2-D gel electrophoresis. Also write its application in proteomics and biomarker discovery.

c) Explain working, principle and application of mass spectrometry.

Q 4. **(2X7=14)**

a) Describe the essential steps involved in whole genome sequencing (WGS).

b) Discuss any ONE method of high-throughput cloning and expression system.

c) What is antibody engineering and its relevance? How does Phage Display help in synthesizing engineered antibodies?

Q 5. **(2X7=14)**

a) Write the principle and methodology involved in analyzing the proteins by LC-MS.

b) What are biomarkers? Write down the classification of biomarkers with examples.

c) What is protein fragment complementation and write about the reporters used in PCA.

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Term End Examinations January 2023

Programme: M.Sc. Biochemistry **Session: 2022-23**

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

Course Title: Clinical Biochemistry **Max. Marks: 70**

Course Code: SIAS BC 1301GEC4004

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 the difference between serum and plasma? How they are stored?
b) What is the composition of cerebrospinal fluid?
c) Write a short note on hypoglycemia.
d) How Lactate Dehydrogenase help in diagnosis of Acute Myocardial Infraction?
e) Write about "Specificity of a reaction" in terms of quality control.
f) What are the different types of vials used to collect blood sample?
g) What is bilirubin? Discuss its clinical relevance.

Q 2. (2X7=14)

a) Discuss different types of anticoagulants and their role in sample collection.
b) Discuss about collection and preservation of urine specimen.
c) What are the responsibilities of a clinical Biochemist?

Q3. (2X7=14)

a) What is Levy-Jennings's chart? Discuss its significance.
b) How will you define Precision, Accuracy and Sensitivity?
c) What is quality assurance? How it is different from quality control?

Q 4. (2X7=14)

a) What are isoenzymes? Give suitable examples along with their diagnostic importance.
b) What is diabetes mellitus? How it is diagnosed?
c) Discuss any two biochemical test in clinical practice.

Q 5. (2X7=14)

a) What are Liver Function Test (LFT)?
b) Discuss about various tests involved in Kidney Function Test.
c) Discuss regulation of acid base balance in our body.