2022

3rd Semester Examination

CHEMISTRY (Honours)

Paper : SEC 1-T

(CBCS)

Full Marks : 25 Time : Two Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

[Analytical Clinical Biochemistry]

Group - A

Answer any ***three*** questions. 2×3=6

1. (a) Name a sugar that does not reduce Tollens' reagent.

   (b) Name the coenzyme which acts as an oxidising agent in glycolysis.

2. (a) What are the two fundamental 'building block' of lipids?

   (b) Differentiate between amylase and amylopectin.

P.T.O.

3. (a) How many hydrogen bonds are present in G-C base pairs in DNA?

   (b) Write down the structure of adenosine.

4. (a) Name the amino acid that can form disulphide bond among themselves.

   (b) Give the name of a stereospecific enzyme.

5. (a) Describe briefly the role of cholesterol in membrane fluidity.

   (b) Mention one anticoagulant for collection of human blood.

Group - B

Answer any *two* questions. 5×2=10

6. Describe briefly the Kreb's cycle process during glucose metabolism. How many molecules of ATP are generated in Kreb's cycle? What is glycolysis? 3+1+1

7. Draw alpha-helix and beta-pleated sheet structure of protein. Among the following protein based substrate like wool, cobweb, muscle and silk which are consists of alpha-helix structure and which are consists of beta-sheet structure? 3+2

8. Describe briefly 'transcription' and 'translation'. What is prosthetic group. Cite an example. What is 'holoenzyme' and 'apoenzyme'? 3+1+1

Group - C

Answer any *one* question. 9×1=9

9. (a) Define primary, secondary and tertiary structure of a protein. 3

   (b) What is anaemia? Which amino acid sequence defect causes it? 2

   (c) How are hydrophobic lipids such as cholesterol and other molecules transported through the body in aqueous body fluids (such as blood)? 4

10. (a) Write down the important characteristics of Watson Crock model for DNA. 4

    (b) Write the composition of RNA. What are the main differences between RNA and DNA? 1+1

    (c) State the role of elevated LDL in cardiovascular disease. 2

    (d) What do you understand by PP sugar? 1

P.T.O.

OR

[Pharmaceutical Chemistry]

1. Answer any ***three*** questions : 2×3=6

(i) (a) Define pro 'drug' with example.

(b) What is the chemical name of aspirin? Write down the structure of aspirin.

(ii) What are antifungal agents? Give one example.

(iii) (a) Which microorganism is used in the production of citric acid?

(b) Show the synthesis of ibuprofen.

(iv) Write the differences between Aerobic and Anaerobic Fermentation.

(v) (a) What is the configuration of lysine, produced by fermentation process?

(b) Name two antibiotics that are produced by fermentation.

2. Answer any ***two*** questions : 5×2=10

(i) (a) Show the retrosynthetic and synthetic pathways to synthesise sulphonamide.

(b) Write uses of sulphonamides. 2+2+1

(ii) (a) Show the synthetic route of phenobarbital.

(b) Write two uses of phenobarbital. 2½+2½

(iii) (a) Write a short note on the production of vitamin B_{12} by fermentation process.

(b) Give an example of anti-HIV agent along with its structure. 3+2

3. Answer any ***one*** question : 9×1=9

(i) (a) Explain the term "Lead Compound" with suitable example in relation to drug design. 3

(b) Why is water solubility an important factor in drug design? 3

(c) Write down the procedure for the synthesis of chloramphenicol. 3

(ii) (a) Describe fermentation process for synthesis of lysine. 3

(b) Show the schematic diagram for the production of ethanol by fermentation process. 3

(c) Give an example of antiviral agent and write down its synthesis. 3