

**2024/TDC(CBCS)/ODD/SEM/
CHMSEC-301T/350**

TDC (CBCS) Odd Semester Exam., 2024

**CHEMISTRY
(3rd Semester)**

Course No. : CHMSEC-301T

(Analytical Clinical Biochemistry)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. Answer any *three* from the following : 1×3=3

(a) Define mutarotation.

(b) What are the inhibitors of glycolysis?

(c) State True or False :

Glycosidic linkages in starch and cellulose are α and β respectively.

(d) Which enzyme converts α -D-glucopyranose to glucose 6-phosphate?

2. Answer any *one* from the following : 2
- (a) Give the mechanistic approach for the conversion of 2-phosphoglycerate from 1,3-biphosphoglycerate in glycolysis.
- (b) How can NAD^+ be biochemically synthesized from pyruvate? Give the reactions involved in this reaction.
3. Answer any *one* from the following : 5
- (a) Explain the overall reactions of glycolysis with schematic reaction steps.
- (b) Explain the reactions involved in lactic acid and ethanol fermentation. $2\frac{1}{2}+2\frac{1}{2}=5$

UNIT—II

4. Answer any *three* from the following : $1 \times 3 = 3$
- (a) Define isoelectric point of amino acid.
- (b) Name two amino acids that contain aromatic rings in their side chains.
- (c) Define coenzyme.
- (d) How does temperature affect the enzyme activity?

5. Answer any *one* from the following : 2

- (a) Define secondary structure of protein.
- (b) Discuss about the induced-fit theory of enzyme action.

6. Answer any *one* from the following : 5

- (a) Specify the factors responsible for the rates of enzyme catalyzed reaction. Briefly describe the specificity of enzyme action. 3+2=5
- (b) What is the denaturation of a protein? Mention physical and chemical effects that contribute in denaturing protein. Mention two important biological importances of protein. 1+2+2=5

UNIT—III

7. Answer any *three* from the following : 1×3=3

- (a) What are fatty acids?
- (b) Define glycerolipids.
- (c) What are androgens and estrogens?
- (d) What are the differences between peptide and steroid hormones?

8. Answer any *one* from the following : 2

(a) What are the biochemical functions of steroid hormones?

(b) Write the biological functions of cholesterol.

9. Answer any *one* from the following : 5

(a) What are liposomes? How do they differ from micelles? Outline the biological roles of liposomes and lipoproteins.

1+2+2=5

(b) Name the five classes of steroid hormones. Give one example of each and briefly outline their biological functions.

1+2+2=5

UNIT—IV

10. Answer any *three* from the following : 1×3=3

(a) What is RBC?

(b) Define the term 'hemostasis'.

(c) Define urine composition.

(d) Define anaemia.

11. Answer any *one* from the following : 2

(a) How can estimation of cholesterol be done by chemical method?

(b) What are the causes of different types of anaemia?

12. Answer any *one* from the following : 5

(a) Briefly discuss about the compositions and functions of blood. 3+2=5

(b) Describe the process of urine formation in kidneys. How can the preservation of urine sample be done? 2+3=5

UNIT—V

13. Answer any *three* from the following : 1×3=3

(a) What is bilirubin?

(b) What is creatinine coefficient?

(c) What does high level of uric acid in urine indicate?

(d) Define the term 'chromogen'.

14. Answer any *one* from the following : 2

(a) How can chemical examination be done for identification of protein in the urine sample?

(b) What are the normal and abnormal ranges of cholesterol? How do you interpret the abnormal ranges of blood sugar?

15. Answer any *one* from the following : 5

(a) Describe the process involved in urine analysis. Explain the physical and chemical examination processes for urine analysis.

(b) Briefly describe how blood glucose levels are measured by using GOD-POD method. What are type-1 and type-2 diabetes mellitus? 3+2=5
