2022/TDC/ODD/SEM/
CHMHCC–501T/293

TDC (CBCS) Odd Semester Exam., 2022

CHEMISTRY

(Honours)

(5th Semester)

Course No. : CHMHCC–501T

(Biomolecules)

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 *two* of the following questions : 2×2=4

(a) What are the heterocyclic bases present in DNA and RNA?

(b) What are nucleosides and nucleotides? 1+1=2

(c) Draw the structures of G–C and A–T base pairs indicating H-bond between them. 1+1=2

2. Answer any *one* of the following questions : 6

(a) *(i)* Carry out the synthesis of cytosine. 3

(ii) Draw the structures of uridine and guanosine. 2

(iii) What are the structural differences between DNA and RNA? 1

(b) *(i)* How will you synthesize thymine from urea? 2

(ii) Write the salient features of double-helix structure of DNA. 3

(iii) What are the different types of RNA? 1

UNIT—II

3. Answer any *two* of the following questions : 2×2=4

(a) Give one example each of acidic, basic, heterocyclic and essential amino acids. ½×4=2

(b) Write a short note on isoelectric point of amino acid.

(c) How will you prepare alanine by Gabriel synthesis?

4. Answer any *one* of the following questions : 6

(a) *(i)* What is peptide linkage? Describe Merrifield solid-phase synthesis of a dipeptide. 1+3=4

(ii) Explain the secondary structure of protein. 2

(b) *(i)* Describe Strecker synthesis of α-amino acid taking a suitable example. 2

(ii) Describe one method of N-terminal residue analysis of peptides. 2

(iii) What do you mean by denaturation of protein and electrophoresis? 1+1=2

UNIT—III

5. Answer any *two* of the following questions : 2×2=4

(a) Write the salient features of active site of an enzyme.

(b) What are the differences between inorganic catalyst and enzyme?

(c) Define the terms coenzyme and turnover number of enzyme. 1+1=2

6. Answer any *one* of the following questions : 6

(a) *(i)* What are the characteristics of an enzyme? 2

(ii) Describe the steps involved in an enzyme-catalyzed reaction. 2

(iii) Discuss various factors affecting an enzyme-catalyzed reaction. 2

(b) *(i)* Discuss specificity of enzyme action taking suitable example. 2

(ii) Explain competitive and non-competitive inhibition of enzyme action. 2

(iii) Describe the metabolic function of NAD. 2

UNIT—IV

7. Answer any *two* of the following questions : 2×2=4

(a) Define oils and fats. Give example of each. 1+1=2

(b) What is the acid value of oil or fat? What does this value indicate? 1+1=2

(c) What is meant by *trans*-esterification? Give one example.

8. Answer any *one* of the following questions : 6

(a) *(i)* What is saponification value? What does it signify? How is saponification value of an oil determined? 1+1+2=4

(ii) Explain oxidative and hydrolytic rancidities. 1+1=2

(b) *(i)* Define iodine value. What is its significance? 1+1=2

(ii) Write short notes on the following : 1+1=2

(1) Drying

(2) Hardening of oil

(iii) Describe the biological importance of lipids. 2

UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) What are analgesic and antipyretic drugs? Give examples. 1+1=2

(b) Write medicinal uses of curcumin and azadirachtin. 1+1=2

(c) Explain broad spectrum and narrow spectrum antibiotics. 1+1=2