**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 :

                                         $2 \times 2 = 4$

    (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 :

                               $2 \times 2 = 4$

    (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

( *Turn Over* )

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

*(a)*   *(i)* Discuss the synthesis and therapeutic uses of ibuprofen.   2+1=3

*(ii)* What are antacids? Discuss medicinal uses of vitamin C and renitidine.   1+1+1=3

*(b)*   *(i)* Describe the synthesis, uses and mode of action of chloramphenicol.   2+1½+1½=5

*(ii)* Name two antibiotics which are specific for certain disease.   1

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