63/1 (SEM–5) CC11/CHMHC5116

2023

CHEMISTRY

Paper : CHMHC5116

(Organic Chemistry–IV)

Full Marks : 60

Pass Marks : 24

Time : Three hours

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

1. Choose the correct answer : ***(any five)*** 1×5=5

   (a) Which base is not present in RNA ?

   (i) Adenine

   (ii) Thymine

   (iii) Uracil

   (iv) Cytosine

(b) Which one is the complementary base of adenine in opposite strand of DNA ?

(i) Thymine

(ii) Uracil

(iii) Cytosine

(iv) Guanine

(c) Anaerobic carbohydrate metabolism is also known as

(i) Glycolysis

(ii) Krebs cycle

(iii) Glyoxylate cycle

(iv) Ornithine cycle

(d) Sanger's reagent is

(i) Ninhydrin

(ii) 2,4-Dinitrofluorobenzene

(iii) Phenyl isothiocyanate

(iv) Phthalic anhydride

(e) Which of the following reactions can be used for the synthesis of α-amino acids ?

(i) Gabriel phthalimide

(ii) Erlenmeyer azlactone

(iii) Strecker synthesis

(iv) All of the above

(f) The dehydrogenation of succinic acid into fumeric acid in step 8 of Krebs cycle is performed by the coenzyme

(i) NaDH

(ii) NAD^+

(iii) FAD

(iv) $FADH_2$

(g) How many ATPs are generated in Krebs cycle ?

(i) 8

(ii) 10

(iii) 12

(iv) 15

(h) Which one of the following is antacid ?

(i) Curcumin

(ii) Paracetamol

(iii) Rantidine

(iv) Azadirachtin

(i) Scurvy is caused by the deficiency of

(i) vitamin A

(ii) vitamin B

(iii) vitamin C

(iv) vitamin K

(j) The Krebs cycle is also known as

(i) Succinic acid cycle

(ii) Citric acid cycle

(iii) Malic acid cycle

(iv) Oxaloacetic acid cycle

2. Answer the following questions : ***(any five)*** 2×5=10

(a) Write *two* medicinal values of curcumin (haldhi).

(b) What are antipyretics and analgesics ?

(c) What do you mean by essential and non-essential amino acids ? Give examples.

(d) What do you mean by allosteric inhibition of enzyme action ?

(e) Define reversion.

(f) Draw the structure of AMP (adenosine monophosphate).

(g) Explain about ionic nature of amino acids.

3. Answer the following questions : ***(any five)*** 5×5=25

(a) Write the different steps involved in glycolysis. Explain the interrelationship of carbohydrate, lipid and protein metabolism.

(b) Define anabolism and catabolism. Explain about ATP hydrolysis and free energy change.

(c) What is rancidity ? Discuss its mechanism. How can it be prevented ?

(d) What are antibiotics? Write the synthesis of chloramphenicol.

(e) What happens when α-amino acids react with ninhydrin? Write the chemical reactions.

(f) What happens when guanine is treated with nitrous acid? How will you convert guanine to guanosine?

(g) Write briefly about the metabolic pathways of protein.

(h) What are oil and fats? Define the terms 'saponification value' and 'acid value' with their significance.

(i) Explain *any one* method for *N*-terminal residue analysis of peptide chain.

4. Answer the following questions : ***(any two)*** 10×2=20

(a) What are nucleosides and neucleotides? Write the structure and synthesis of adenine and guanine.

(b) What are peptides? Explain the solid phase synthesis of peptides.

(c) State the characteristics of enzymes. Explain the mechanism of enzyme action with example.

(d) Give the structure, synthesis and uses of ibuprofen and chloroquine.
