2022

(Held in 2023)

ZOOLOGY

Paper : ZOOHC3076

(Fundamentals of Biochemistry)

Full Marks : 60
Pass Marks : 24

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct options from the following : 1×5=5

(a) A monosaccharide with the carbonyl group at the end of the carbon chain is a/an

(i) aldose

(ii) ketose

(iii) epimers

(iv) enantiomers

(b) Which lipid serves as energy storage?

(i) Phospholipid

(ii) Glycolipid

(iii) Cholesterol

(iv) Triacylglycerol

(c) In an enzyme catalysed reaction, a low K_m value for an enzyme corresponds to

(i) high affinity for the substrate

(ii) low affinity for the substrate

(iii) the substrate concentration

(iv) maximum reaction rate

(d) In a nucleic acid, nucleotides are linked to each other by

(i) glycosidic bonds

(ii) phosphodiester bonds

(iii) peptide bonds

(iv) hydrogen bonds

(e) Which group of immunoglobulin is present in tears, saliva, sweat and colostrum?

(i) IgG

(ii) IgE

(iii) IgA

(iv) IgM

2. Answer the following questions (short answer-type) : 2×5=10

(a) Give the common structural features of an amino acid.

(b) What are co-factors?

(c) State the differences between essential and non-essential amino acids.

(d) Which type of reactions are catalysed by transferase enzymes? Give example.

(e) Differentiate between fibrous proteins and globular proteins.

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

(a) Describe the structure and function of phospholipids.

(b) Explain the changes observed in V_{max} and K_m values in a competitive and non-competitive inhibition using the double-reciprocal plot.

(c) Name the different types of RNA and discuss their structure and function.

(d) Describe nucleic acid and discuss its various components.

(e) Write a note on the classification of amino acids based on their different side chains.

(f) Describe the structure and function of glycogen.

(g) Discuss the effects of temperature, pH and substrate concentration on an enzyme catalysed reaction.

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

(a) Describe the structure of an immunoglobulin with appropriate diagram. Write a note on various classes of immunoglobulins and their functions. 4+6=10

(b) What are multi-substrate reactions? Discuss the two classes of multi-substrate reactions. 2+8=10

(c) What are homopolysaccharide and heteropolysaccharide? Give example. Elaborate the structural and storage roles played by polysaccharides in living systems. 3+7=10

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