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3 (Sem-3/CBCS) ZOO HC 3

2021

(Held in 2022)

**ZOOLOGY**

(Honours)

Paper : ZOO-HC-3036

**(Fundamentals of Biochemistry)**

Full Marks : 60

Time : Three hours

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

1. Answer the following as directed :  
**(any seven)**  $1 \times 7 = 7$
- (a) Which amino acid is the precursor of melanin pigments of skin?
- (b) Name *two* amino acids which act as neurotransmitter in the brain.
- (c) Side chains of all of the following amino acids contain aromatic rings, except
- (i) phenylalanine
  - (ii) alanine
  - (iii) tyrosine
  - (iv) tryptophan

*(Choose the correct option)*

Contd.

- (d) The alpha helix formation is due to
- (i) intramolecular hydrogen bonds
  - (ii) intermolecular hydrogen bonds
  - (iii) van der Waals interaction between amino acids
  - (iv) ionic interactions
- (Choose the correct option)*
- (e) A gene codes for a protein of 200 amino acids length. What is the size of gene in terms of bp?
- (f) Give *two* examples of fibrous protein.
- (g) An essential fatty acid is one, that cannot be synthesised by the body and therefore required essentially in diet. Name *two* essential fatty acids.
- (h) If the DNA of a species has the mole fraction of  $G + C = 0.36$ , the mole fraction of  $A + T$  will be
- (i) 0.64
  - (ii) 1.28
  - (iii) 0.36
  - (iv) 0.32
- (Choose the correct option)*
- (i) Coenzymes FMN and FAD are derived from
- (i) vitamin C
  - (ii) vitamin B6
  - (iii) vitamin B1
  - (iv) vitamin B2
- (Choose the correct option)*

2. Answer **any four** of the following :

2×4=8

- (a) What is the difference between oxidase and oxygenase enzymes ?
- (b) Write down the structural formula of nucleotide.
- (c) Distinguish between IgG and IgM.
- (d) What is denaturation of protein.
- (e) What are derived lipids ? Give examples.

3. Answer **any three** from the following :

5×3=15

- (a) Describe the structure and function of mucopolysaccharides.
- (b) Describe the structure and function of phospholipids.
- (c) What is Chargaff's rule ? "The backbone of nucleic acid structure is 3'-5' phosphodiester bridge." Justify.
- (d) What are coenzymes ? Write briefly the role of coenzymes in enzyme action.

(e) What is immunoglobulin domain?  
Draw a schematic diagram of structure  
of immunoglobulin.

Answer the following questions : **(any three)**  
10×3=30

4. What is epitope? Write in detail about the structure and function of different isotypes of antibody. 2+8=10
5. Write an account of various factors affecting enzyme action. Write an explanatory note on the classification and nomenclature of enzymes. 4+6=10
6. What is complementary base pairing? Name different RNA and discuss their structure and function. 2+8=10
7. Discuss the saturated and unsaturated fatty acids of biological importance, along with their structures. 10
8. Discuss the structure and functions of three biochemically important disaccharides and three homopolysaccharides. 10