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respectively. Discuss with structural details

(6, 6,6)

(200)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3007

I

Unique Paper Code : 3184002001

Name of the Paper : Biochemical Basis of Life -
UGCF-GE Paper

Name of the Course : **B.Sc. (Hons) Biomedical
Science**

Semester : III (2024)

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Answer five questions **in all**
3. **Question No.1** is compulsory.
4. Give illustrations and examples wherever necessary
5. Subparts of the questions should be attempted together

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1. (a) Define (Any Three)

(i) Gibb's Free Energy

(ii) Coupling reactions

(iii) Phototrophs

(iv) Open System

(v) Chemotrophs

(3×2=6)

(b) Indicate whether true or false with justification:

(Any three)

(i) Primary structure of a protein determines its higher levels of structural organization.

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(i) Nucleotide

(ii) Glycogen

(iii) Polypeptide

(b) State the biological functions of the following molecules:

(i) Insulin

(ii) Albumin

(iii) Amylase

(c) Explain the roles of starch and glycogen as energy storage molecules in plants and animals,

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(iii) Formation of biological polymers from their monomers

(c) Identify and explain two major landmark events in the evolutionary history of life. (6,6,6)

5. (a) Discuss the tissue of origin and storage, as well as the function and structure of insulin and triglycerides.

(b) Explore the similarities between prokaryotic and eukaryotic cells.

(c) Discuss the role of enzymes in biochemical reactions, including their mechanisms of action and factors affecting their activity. (6,6,6)

6. (a) Draw and explain the structure of the following biological molecules:

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(ii) Sites of DNA synthesis differ in prokaryotes and eukaryotes.

(iii) Cell wall of both bacteria and plants are composed of cellulose.

(iv) DNA is an ideal genetic material.

(v) C, H, O, N and S are essential elements for life (3×2=6)

(c) Write Short Notes: (Any three)

(i) Kw

(ii) Energy Coupling Reactions

(iii) Biological Polymers

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(iv) Trace elements (3×2=6)

2. (a) Differentiate between the following (Any Three)

(i) Endothermic and Exothermic Reaction

(ii) Enzymes and Hormones

(iii) Autotrophs and Heterotrophs

(iv) Macronutrients and Micronutrients
(3×4=12)

(b) Discuss the structure and function of collagen
(6)

3. (a) What is free energy in a system, and how does it relate to the system's entropy and enthalpy?

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(b) Explain the biochemical basis for the emergence of aerobic and anaerobic organisms.

(c) Describe the role of ATP as the cell's energy currency. (6,6,6)

4. (a) How did biological monomers and polymers evolve from prebiotic compounds? Discuss the process.

(b) What is the sign of entropy change for the following reactions?

(i) Freezing of water

(ii) Evaporation of water