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3 (Sem-1/CBCS) BOT HC 2

2023

BOTANY

(Honours Core)

Paper : BOT-HC-1026

(Biomolecules and Cell Biology)

Full Marks : 60

Time : Three hours

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

1. Fill in the blanks : 1×7=7
- (a) Chelating agents acts as _____ inhibitors.
- (b) Nucleoside is a compound in which a nitrogenase base is conjugated to a pentose sugar by a _____.
- (c) Oxidation of fatty acid is an example of _____ reaction.

Contd.

- (d) Secondary structure of protein includes _____.
- (e) A water molecule has _____ polar covalent bonds.
- (f) Replication of DNA takes place in _____ phase.
- (g) A buffer has a definite _____ value.

2. Answer the following questions : $2 \times 4 = 8$

- (a) What are the differences between fats and oils?
- (b) Cite *two* functions of microtubules.
- (c) What do you mean by Endosymbiotic Theory?
- (d) Why ATP is called energy currency of the cell?

3. Answer **any three** of the following briefly :

$5 \times 3 = 15$

- (a) Describe the role of protein kinases in cell cycle.

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- (b) Discuss on the semi-autonomous nature of mitochondria.
- (c) Explain the different types of enzyme inhibition.
- (d) State the differences between B-DNA and Z-DNA.
- (e) How proteins are inserted in endoplasmic reticulum?

4. Answer the following questions :

- (a) What are enzymes? Describe the mechanism of enzyme action.

$2 + 8 = 10$

Or

What is Chromatin? Describe the molecular organization of chromatin.

$2 + 8 = 10$

- (b) Explain in detail the structural organization of proteins. 10

Or

Discuss the process of protein glycosylation within Golgi apparatus.

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Contd.

(c) What is bioenergetics ? Discuss the first and second law of thermodynamics and its relevance to biological systems.

2+4+4=10

Or

Give an elaborate account of fluid-mosaic model of plasma membrane with suitable diagram.

8+2=10