



WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 1st Semester Examination, 2019

BOTACOR02T-BOTANY (CC2)

BIOMOLECULES AND CELL BIOLOGY

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

1. Answer **all** questions briefly from the following: 1×5 = 5
- (a) Name one amino acid which does not possess any asymmetric carbon atom.
 - (b) Name the C_4 epimer of glucose.
 - (c) What is phosphodiester bond?
 - (d) Define kinetochore.
 - (e) Name different phases of eukaryotic cell cycle.

2. Answer any **five** questions from the following: (At least **two** questions from each Group) 3×5 = 15

GROUP-A

- (a) Give the pyran and furan structures of hexose. 3
- (b) Differentiate between nucleoside and nucleotide. 3
- (c) Mention the basic differences between mRNA and rRNA. 3
- (d) Write a note on competitive inhibition. 3

GROUP-B

- (e) Outline the fluid-mosaic model of plasma membrane. 3
- (f) With suitable diagram describe the structural details of nucleolus. State its function. 2+1
- (g) Justify the semi autonomous nature of mitochondria. 3
- (h) Differentiate between mitotic and meiotic cell division. 3

3. Answer any **four** questions from the following: (At least **two** questions from each Group) 5×4 = 20

GROUP-A

- (a) Differentiate between purine and pyrimidine. Describe the structure of tRNA with suitable diagram. 2+3

- (b) Calculate V_{\max} of an enzymatic reaction from the following data using Michaelis Menten equation 5

$$K_m = 1 \text{ mol L}^{-1}$$

$$[S_0] = 0.5 \text{ mol L}^{-1}$$

$$V_0 = 50 \mu \text{ mol L}^{-1} \text{ min}^{-1}$$

- (c) Discuss about the bonds involved in different structural levels of proteins. 5

GROUP-B

- (d) Briefly describe the biogenesis of ribosome in nucleus with suitable diagram. 5
- (e) What is smooth ER? How does it differ from rough ER? What role does RER play in cell organization? 1+2+2
- (f) Give the chemical constituents of plant cell wall. What is glycocalyx? Define exocytosis. 3+1+1

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