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: $1 \times 5 = 5$

(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) $3 \times 5 = 15$

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) $5 \times 4 = 20$

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

$$K_m = 1\,\text{m mol L}^{-1}$$
$$[S_0] = 0.5\,\text{m mol L}^{-1}$$
$$V_0 = 50\,\mu\,\text{mol L}^{-1}\,\text{min}^{-1}$$

(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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