

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY****FIRST SEMESTER – NOVEMBER 2022****PBT1MC01 – CELL BIOLOGY AND MOLECULAR GENETICS**

Date: 23-11-2022

Dept. No. 

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

**SECTION - A****Answer ALL the Questions**

<b>1</b>	<b>Choose the best option</b>	<b>(5 x 1 = 5)</b>	
a)	What is the shape of kinetochore? a) Cylindrical b) Disc-shaped c) Spherical d) Triangular	K1	CO1
b)	SH2 domains mainly bind to a) GDP b) Ca <sup>2+</sup> c) Phosphorylated tyrosine residues d) Phosphorylated serine residues	K1	CO1
c)	Which of the following method does not require any channel for transport of substances? a) Secondary active transport b) Facilitated diffusion c) Simple diffusion d) Primary active transport	K1	CO1
d)	Types of histones present in eukaryotes are a) H1,H2,H3,H4,H5 b) H1,H2A,H2B,H3,H4 c) H1,H2A,H2B,H3A,H4 d) H1,H2,H3A,H3B,H4	K1	CO1
e)	Sickle cell anaemia is caused a) When valine is replaced by glutamic acid in beta polypeptide chain b) When glutamic acid is replaced by valine in beta polypeptide chain c) When glutamic acid is replaced by valine in alpha polypeptide chain d) When valine is replaced by glutamic acid in alpha polypeptide chain	K1	CO1
<b>2</b>	<b>Answer in one or two sentences</b>	<b>(5 x 1 = 5)</b>	
a)	What happens during the metaphase stage of mitosis?	K2	CO1
b)	How would you relate plasmodesmata and turgor pressure?	K2	CO1
c)	Where are SNARE proteins found?	K2	CO1
d)	Mention the importance of TBP.	K2	CO1
e)	Define Mendelian factor.	K2	CO1

**SECTION - B****Answer any THREE of the following in 500 words****(3 x 10 = 30)**

3	Briefly describe the structure of chloroplast and function.	K3	CO2
4	Give an account on chemotaxis in bacteria.	K3	CO2
5	Illustrate the key steps in protein folding and processing in endoplasmic reticulum.	K3	CO2
6	DNA replication in <i>E.coli</i> follows the semi conservative model. Demonstrate.	K3	CO2
7	Paraphrase and explain about incomplete dominance at molecular level.	K3	CO2

**SECTION - C****Answer any TWO of the following in 500 words****(2 x 12.5 = 25)**

8	Explain the structure and organization of plasma membrane.	K4	CO3
9	a) Summarize the role of "intermediate filaments" in cells? How did they get this name?	K4	CO3

	b) Sketch the pathway for endocytosis.		
10	Construct a table for possible types of DNA damage, its specifications and explain an appropriate repair mechanism for the same.	K4	CO3
11	Paraphrase and explain about codominance using example at molecular level.	K4	CO3

**SECTION - D**

**Answer any ONE of the following in 1000 words**

**(1 x 15 = 15)**

12	Discuss in detail how kinesin coordinate their steps along with dynein in transport of biomolecules	K5	CO4
13	Elaborate on the core concept of cell- cell communication.	K5	CO4

**SECTION - E**

**Answer any ONE of the following in 1000 words**

**(1 x 20 = 20)**

14	Elucidate the importance of membrane physiology in cell biology	K6	CO5
15	Compare and contrast: Regulation of gene expression in bacteria and eukaryotes. or Illustrate and explain the concept of extra nuclear inheritance. Compare and contrast it with Mendelian principles of nuclear inheritance.	K6	CO5

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