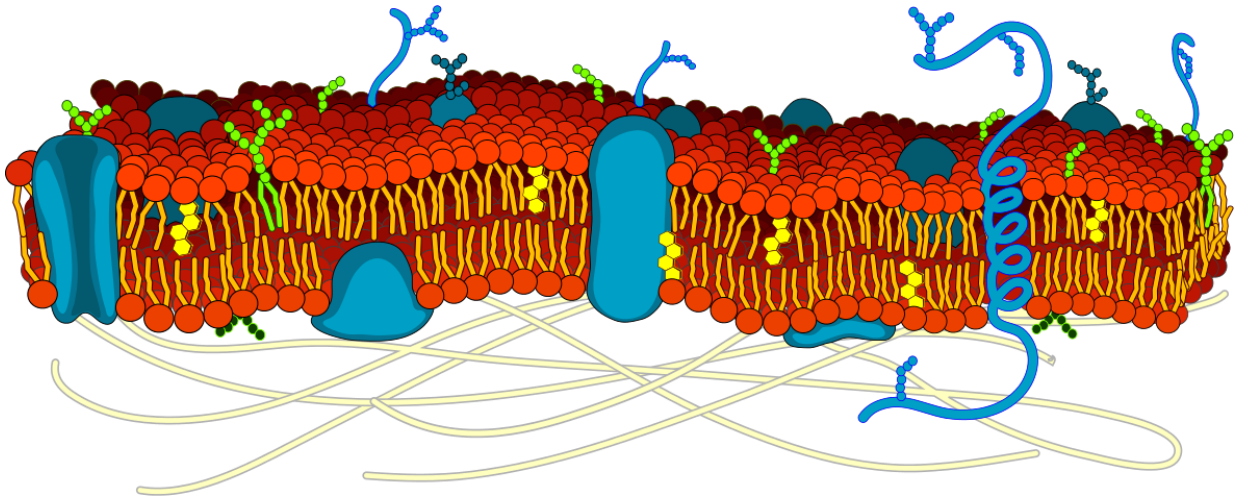
CBT OCTOBER 2023-24
CLASS XI BIOLOGY

GENERAL INSTRUCTION :

TOTAL NO OF QUESTIONS 10
ALL QUESTIONS ARE COMPULSORY
07QUESTIONS IN SECTION 2 FROM CHAPTER CHAPTER 8 : CELL : THE UNIT OF LIFE AND CHAPTER9 : BIOMOLECULES
03QUESTIONS IN SECTION 3 FROM CHAPTER 10 : CELL CYCLE AND CELL DIVISION UNIT OF LIFE, CHAPTER 9 : BIOMOLECULES
Q.1 AND Q.2 are case based.

The detailed structure of the membrane was studied only after the advent of the electron microscope in the 1950s. Meanwhile, chemical studies on the cell membrane, especially in human red blood cells (RBCs), enabled the scientists to deduce the possible structure of the plasma membrane and a model was first proposed by S.J. Singer and Garth L. Nicolson in 1972 to explain the structureof the plasma membrane. The model has evolved somewhat over time, but it still best accounts for the structure and functions of the plasma membrane as we now understand them. These studies showed that the cell membrane is composed of lipids, proteins and carbohydrates.

N**OW ANSWER QUS No. 1 AND QUS No. 2**



1. Which component of the plasma membrane is arranged as a bilayer?

a) Nucleic acid

b) Lipid

c) Protein

d) Carbohydrate

ANS. b) Lipid

EXPLANATION: Phospholipids constitute a main element of biological membranes, they are the most abundant lipids found in the membrane. It is composed of a phospholipid bilayer, which is

two layers of phospholipids back-to-back. Phospholipids are lipids with a phosphate group associated with them

Q2. What percentage of the membrane of human erythrocytes consists of proteins ?

a) 40
b) 70
c) 52
d) 66

ANS. C) 52

EXPLANATION : The ratio of protein and lipids varies considerably in different cell types. The membrane of the erythrocytes has approximately 52% of proteins and 40% lipids.

Q3. Select the option with correct labelling of the given structure of Golgi apparatus :

a) A - Cisternae, B - Vesicle, C – trans face, D – cis face.
b) A - Cisternae, B - Vesicle, C – cis face, D – trans face.
c) A - Vesicle, B - Cisternae, C – cis face, D – trans face.
d) A - Tubules, B - vesicles, C – trans face, D – cis face.

ANS. a) A - Cisternae, B - Vesicle, C – trans face, D – cis face.

EXPLANATION : Option A shows the correct labelling of the given structure of Golgi apparatus

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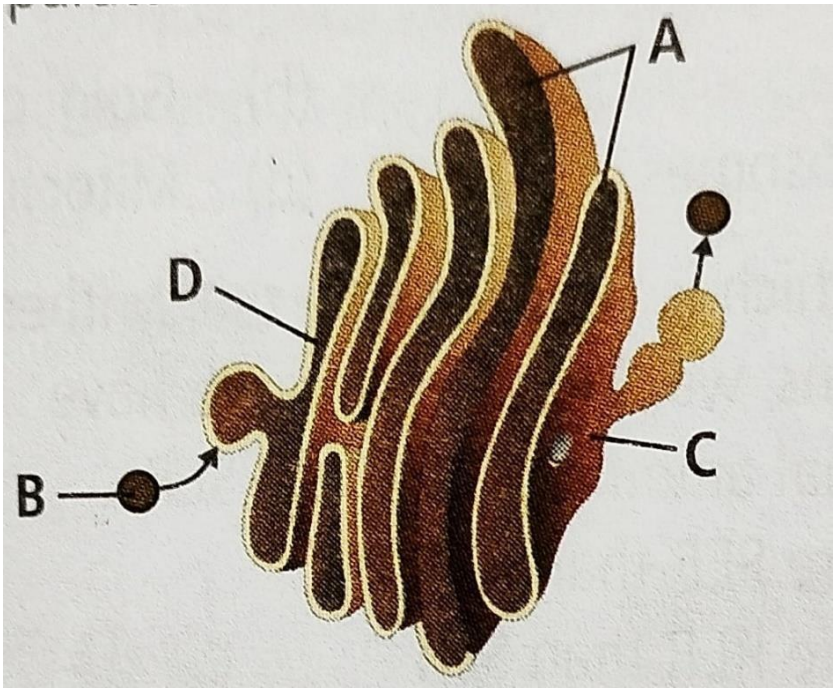


Q4. Correct sequence of layers of bacterial cell envelope from outward to inward is:

a) Cell wall, Glycocalyx, Cell membrane
b) Cell membrane, Glycocalyx, Cell wall
c) Glycocalyx, Cell wall, Cell membrane
d) Glycocalyx, Cell membrane, Cell wall

ANS. c) Glycocalyx, Cell wall, Cell membrane

EXPLANATION : Option (c) shows the Correct sequence of layers of bacterial cell envelope from outward to inward.

Q5. Match column – I with column – II and select the correct option from the codes given below :

	Column I		Column II
A.	RER	(i)	Intracellular and extracellular digestion
B.	SER	(ii)	Lipid synthesis
C.	Golgi complex	(iii)	Protein synthesis and secretion
D.	Lysosomes	(iv)	Moves materials out of the cell

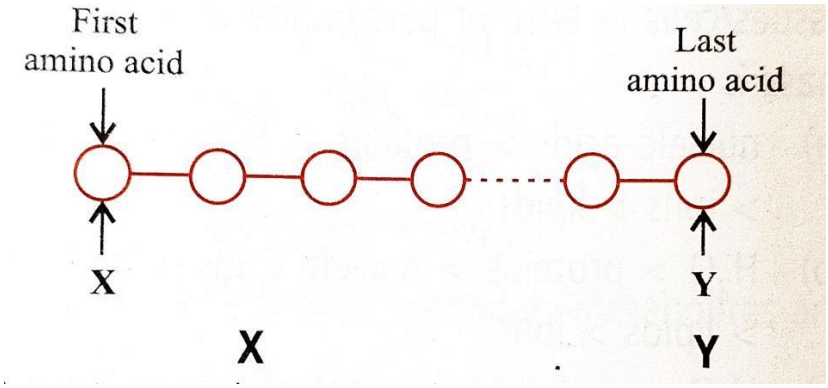
a) A – (iv), B – (ii), C – (iii), D – (i).
b) A – (iii), B – (ii), C – (iv), D – (i).
c) A – (ii), B – (iii), C – (iv), D – (i).
d) A – (i), B – (iii), C – (ii), D – (iv).

ANS. b) A – (iii), B – (ii), C – (iv), D – (i).

EXPLANATION : Option (b) A – (iii), B – (ii), C – (iv), D – (i).

Other options show wrong matching

Q6. Identify X and Y in the given sequence.



a) X – N Terminal amino acid, Y – C Terminal amino acid
b) X – N terminal amino acid, Y – N Terminal amino acid
c) X – C Terminal amino acid, Y – N Terminal amino acid
d) X – C Terminal amino acid, Y – C – Terminal amino acid

ANS. a) X – N Terminal amino acid, Y – C Terminal amino acid

EXPLANATION: While representing the primary structure of a protein, the N – terminal amino acid is always written on the first (left) end of the polypeptide chain and C – terminal amino acid at the right end of the chain.

Q7. The inhibitor which closely resembles the substrate in its molecular structure and inhibits the enzyme activity by binding to the active site of the enzyme is called:

(a) Feedback inhibitor

(b) Non – competitive inhibitor
(c) Competitive inhibitor
(d) Allosteric modulator

* ANS. (c) Competitive inhibitor

EXPLANATION : In competitive inhibition , the inhibitor (I) closely resembles the real substrate (S) and is regarded as a substrate analogue. The inhibitor competes with the substrate and binds at the active site of the enzyme but does not undergo any catalysis. As long as the competitive inhibitor holds the active site, the enzyme is not available for the substrate to bind.

Q.No. 8 to Q.No.10

CASE STUDY BASED

Mitosis occurs during the formation of body cells therefore, called somatic cell division. As the daughter cells resemble their mother cells genetically, it is called equational division. Mitosis leads to production of daughter cells with identical genetic compliment and helps to restore nucleo – cytoplasmic ratio. It also replaces old cells and helps to increase number of cells within an organism.

NOW ANSWER THE QUS. No. 8 TO Q.No.10

The given diagram depicts the different stages of Mitosis which are not in the correct sequence.

Q.No. 8. The Labelling A, B, C and D mentioned in the diagram represented below are:

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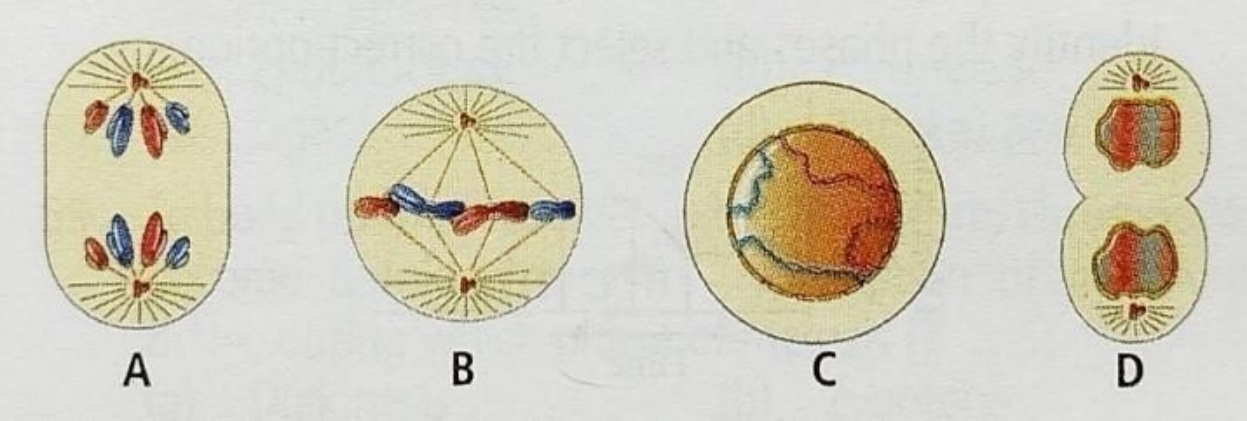

a) A - Prophase, B - Metaphase, C – Telophase and D – Anaphase

b) A - Metaphase, B - Anaphase, C – Prophase and D – Telophase

c) A - Anaphase, B - Metaphase, C – Prophase and D – Telophase

d) A - Prophase, B - Metaphase, C – Anaphase and D – Telophase

ANS. c) A - Anaphase, B - Metaphase, C – Prophase and D – Telophase

EXPLANATION : Option (c) shows the correct labelling of the stages of mitosis

Other options are showing wrong labellings.

Q.9. Which of the following shows the correct sequence of the given mitotic stages?

a) D,C,B,A

b) C,B,D,A

c) B,A,C,D

D) C,B,A,D

ANS. b) C,B,D,A

EXPLANATION : The correct sequence of Mitotic stages are : C – Prophase, B – Metaphase, C – Anaphase, D - Telophase

Q10. Cell would normally proceed to mitosis without interruption:

a) Once it has entered the G1 phase
b) Once it has entered the S phase
c) Once it has entered the G2 phase
d) At any time of the cell division activity

ANS. b) Once it has entered the S phase

EXPLANATION : Once the cell enters the S phase it will proceed to mitosis without interruption

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