

**Class: 11**

**Subject: Biology**

**Topic: Cell : The Unit of life**

**No. of Questions: 25**

Q1. Which organelle is called the engine of the cell?

Sol. Ribosomes where protein synthesis occurs

Q2. What is mycoplasma?

Sol. Mycoplasma is aerobic prokaryote. Cell wall is absent in them & they have a nucleoid.

Q3. Why is karyotype done at metaphase?

Sol. Because metaphase chromosomes are with two chromatids strands of each double chromosome held together at the centromere are clearly seen.

Q4. Expand PPLO

Sol. Pleuropneumonia like organisms.

Q5. What are nuclear pores? State their functions?

Sol. Nuclear envelope contains two parallel membranes & the thickness is 10-50 nm. Outer membrane has small pores called the nuclear pores formed by fusion of two membranes. These pores are the passages through which movement of RNA & protein molecules occurs in both direction between nucleus & cytoplasm.

Q6. Give difference between cell wall & cell membrane?

Sol. CELL WALL

- (a) Present in plant cell exclusively
- (b) Made up of cellulose
- (c) Thick & tough in nature
- (d) Thickening of various kinds present
- (e) It is not selectively permeable

CELL MEMBRANE

- (a) Present predominantly in animal cells
- (b) Made up of proteins fats & water
- (c) Extremely thin & elastic in nature
- (d) No thickenings

(e) Selectively permeable membrane

Q7. Which organelle is responsible for increasing the surface area of absorption in a cell? How?

Sol. The endoplasmic reticulum is responsible for increasing the surface area for absorption. It remains in the form convulated tubule in the cytoplasm in the form of network. This provides more area for chemical reactions and increases the surface area of absorption.

Q8. What is mesosome in a prokaryotic cell? Mention the function that it performs?

Sol. Mesosome in a prokaryotic cell is formed by extensions of plasma membrane into the cell it may be in form of vesicle, tubule or lamella. They help in cell wall formation. They help in replication of DNA & distribution of it to daughter cells. They help in secretion respiration, & increase plasma membrane surface area.

Q9. "Plasma membrane is described as" protein iceberg in sea of lipids". Why?

Sol. The plasma membrane as described by Singer & Nicolson is of fluid mosaic model type. The lipid & proteins are arranged in a mosaic fashion. The matrix is highly viscous fluid of two layers of phospholipids molecules having two types of globular proteins i) peripheral or extrinsic proteins & ii) integral or intrinsic proteins. The proteins present superficially or tightly with the membrane are enzymatic can move across the matrix & help in the active & passive transport of ions through the membrane.

Q10. Mention three similarities & three differences between mitochondria & chloroplasts?

Sol. SIMILARITIES BETWEEN MITOCHONDRIA & CHLOROPLAST i) Mitochondria & chloroplasts are semi-autonomous organelle & they possess their own DNA, RNA as well as ribosomes. ii) They both develop & originate in the same way, formed by division of preexisting organelle iii) Both of them contain circular DNA. DIFFERENCES BETWEEN MITOCHONDRIA & CHLOROPLAST i) Mitochondria occurs in all eukaryotic cells while chloroplast are present only in plant cells. ii) Pigments are absent in mitochondria but always present in chloroplast. iii) The inner membrane of mitochondria are folded into cristae where as cristae are absent in chloroplast.

Q11. "multicellular organisms have better survival than their cellular counterpart" why?

Sol. In unicellular organisms, there is no division of labour. The single cell of the organism is capable of performing all the vital activities of life respiration, movement, digestion & reproduction etc. Respiration, nutrition & excretion generally occur through general body surface no special organs for these are present in them because they are too small to need them. In multicellular organisms all the body cells do not perform all the vital activities of life rather these cells play

more specialized role in life activities eg. some cells of the body perform the function of movement some perform the function of digestion or respiration or removal of wastes from the body some cells perform the function of transport. These cells would perform no other function except for which they are specialized. The group of similar cells performing similar function is termed as tissues.

Q12. Which structure is called little nucleus?

Sol. Nucleolus.

Q13. What is the function of contractile vacuole?

Sol. Water balance or osmoregulation.

Q14. Name the enzymes present in peroxisomes?

Sol. Catalase & Beta- hydroxy-oxidase.

Q15. Who gave the statement "Omnis cellula e cellula"?

Sol. Rudolf Virchow.

Q16. "Both lysosomes & vacuoles are endomembrane structures yet they differ in terms of their functions" comment.

Sol. Lysosomes & the vacuoles are endomembranous structures yet these differ in terms of their functions:- i) Lysosomes contains hydrolytic enzymes eg. lipase, protease which are able to digest lipids, proteins, nucleic acid & carbohydrate. ii) Vacuoles are membrane bound spaces which facilitates transport of many ions & other materials against the concentration gradient.

Q17. Who proposed cell theory? Give its postulates?

Sol. M. J. Schleiden & Theodore Schwann gave the famous cell theory which states as follows:- i) All living things are made of cells & cell products. ii) The cell is the structural & functional unit of all living organisms. iii) All metabolic reactions in the living things take place within the cell The cell theory was later modified by Rudolf Virchow who stated that "all new cells arise from the pre-existing cells".

Q18. Which cell organelle is known as powerhouse of cell & why?

Sol. The double membrane mitochondria are actively associated with aerobic respiration & the release of energy for cellular activity. The biological oxidation of the fats & carbohydrates release much amount of energy which is utilized by mitochondria for ATP synthesis. When required energy is released form ATP molecules for various cell processes in cells so they are termed as "Power house of the cell"

Q19. What are the main functions of cell wall?

Sol. FUNCTIONS OF CELL WALL:- i) It provides a definite shape to the cell. ii) It protects inner contents of cells iii) It protects delicate plasma membrane present below it. iv) It allows transport of various substances to & from the cell. v) It prevents cell contents from drying up.

Q20. Explain the fluid mosaic model of plasma membrane

Sol. The fluid mosaic model was proposed by G.Nicholson & s. singer. According to this each phospholipids layer is bimolecular & their hydrophilic ends are pointed towards top & bottom respectively. In this, proteins are of two categories- peripheral (extrinsic) & integral (intrinsic). The integral proteins are tightly held in place by strong hydrophilic or hydrophobic interactions or both and are difficult to remove from the membranes. Two peripheral proteins are superficially arranged on either side membrane selectively permeable thus this model explains cell membrane is quasifluid & is made up of "protein icebergs in the sea of lipids".

Q21. Cell was discovered by

- (a) Leeuwenhoek
- (b) Robert Hooke
- (c) Robert Swanson
- (d) Robert Brown

Sol. (b)

Q22. The spherical structured organelle that contains the genetic material is

- (a) Cell Walls
- (b) Ribosomes
- (c) Nucleus
- (d) Mitochondria

Sol. (c)

Q23. Protoplasm found inside the nucleus is known as

- (a) Amyloplast
- (b) Nucleoplasm
- (c) Cytoplasm
- (d) Elaioplast

Sol. (b)

Q24. Which of the following statements are true about Endoplasmic Reticulum? (a) Smooth Endoplasmic Reticulum makes lipids. (b) It is also called the control center of the cell. (c) It processes carbohydrates. (d) It modifies chemicals that are toxic to the cell.

- (a) a,b and c
- (b) a,c and d
- (c) only a and d
- (d) all are correct

Sol. (b)

Q25. Prokaryotic genetic system has

- (a) DNA but no histones
- (b) Both DNA and histones
- (c) Neither DNA nor histones
- (d) Either DNA or histones

Sol. (a)