

Unit 3: Cells & Subcellular Organelles

Multiple Choice Questions

MULTIPLE CHOICE QUESTIONS (EXERCISE)

Choose the correct answer.

- Which one of the following eukaryotic cell structures does not contain DNA?
(a) Nucleus
(b) Mitochondrion
(c) Endoplasmic reticulum
(d) Chloroplast
- Which of the following is not an accurate description of a chromosome?
(a) It is a coloured body localized in the nucleus
(b) It is a protein and nucleic acid complex
(c) It is the cellular structure that contains the genetic material
(d) In eukaryotes, it is composed of many DNA molecules attached end to end
- A centriole is an organelle that is:
(a) Present in the centre of a cell's cytoplasm
(b) Composed of microtubules and important for organizing the spindle fibres
(c) Surrounded by a membrane
(d) Part of a chromosome
- The rough endoplasmic reticulum is:
(a) An intracellular double-membrane system to which ribosomes are attached
(b) An intracellular membrane that is studded with microtubular structures
(c) A membranous structure found within mitochondria
(d) Only found in prokaryotic cells
- In the nucleus of eukaryotic cells, the genetic material is complexed with protein and organized into linear structures called:
(a) Centrioles
(b) Histones
(c) Chromosomes
(d) Plasmids
- Which of the following statements does not apply to the nuclear envelope?
(a) It is a double membrane
(b) It is continuous with the endoplasmic reticulum
(c) It has pores through which material enters and leaves
(d) It has infoldings to form cristae
- Lysosomes are formed by budding from which cellular organelle?
(a) Smooth endoplasmic reticulum
(b) Golgi apparatus
(c) Rough endoplasmic reticulum
(d) Nucleus
- All peroxisomes carry out this function:
(a) Break down fats and amino acids into smaller molecules that can be used for energy production by mitochondria
(b) Digest macromolecules using the hydrolytic enzymes they contain
(c) Synthesize membrane components such as fatty acids and phospholipids
(d) Control the flow of ions into and out of the cell
- How would the absence of peroxisomes in a cell affect its metabolism, and what would be the likely symptoms?
(a) The cell would be unable to carry out oxidative phosphorylation, leading to reduced ATP production
(b) The cell would accumulate hydrogen peroxide, leading to oxidative stress and potential cellular damage.
(c) The cell would have impaired protein synthesis, leading to muscle weakness.
(d) The cell would fail to produce lipids, causing membrane instability

10. Which of the following does not apply to chloroplasts?

- (a) They contain chlorophyll and the enzymes required for photosynthesis.
- (b) They contain an internal membrane system consisting of thylakoids.
- (c) They synthesize ATP.
- (d) They are bounded by two membranes, the inner of which is folded into the cristae.

11. What is the correct sequence of membrane compartments through which a secretory protein moves from synthesis to release from the cell?

- (a) SER → Golgi apparatus → RER → Cell membrane

(b) Cell membrane → Golgi apparatus → RER → SER

(c) RER → Golgi → Cell membrane → SER

(d) RER → SER → Golgi apparatus → Cell membrane

12. How does the process of facilitated diffusion differ from active transport?

- (a) Facilitated diffusion requires energy, active transport does not
- (b) Facilitated diffusion does not require energy, active transport does
- (c) Both processes require energy
- (d) Both processes do not require energy

SLO BASED MULTIPLE CHOICE QUESTIONS

Cell theory

13. Who concluded that parts of plants were made of compartments?

- (a) Robert Hooke
- (b) Robert Whittaker
- (c) Louis Pasteur
- (d) Leeuwenhoek

14. Nucleus was discovered by:

- (a) Robert Koch
- (b) Louis Pasteur
- (c) Theodor Schwann
- (d) Robert Brown

15. Which of the following is exception to cell theory?

- (a) Bacteria
- (b) Fungi
- (c) Virus
- (d) Algae

Microscopy

16. Ability to enlarge the image of an object is called:

- (a) Resolution
- (b) Magnification
- (c) Extension
- (d) Expansion

17. Ability to distinguish between two points are close together on an object is:

- (a) Staining
- (b) Magnification
- (c) Resolution
- (d) Division

18. Resolution of light microscope is:

- (a) 0.2 micrometer
- (b) 0.2 millimeter
- (c) 0.2 nanometer
- (d) 0.2 millimeter

19. Resolution of electron microscope is:

- (a) 0.2 nanometer
- (b) 0.2 micrometer
- (c) 0.2 centimeter
- (d) 0.2 centimeter

Structure of cell

20. Yeast and Euglena are:

- (a) Unicellular eukaryotes
- (b) Multicellular eukaryotes
- (c) Non-cellular prokaryotes
- (d) Unicellular prokaryotes

21. Actual cell wall of cell is:

- (a) Secondary wall
- (b) Primary wall
- (c) Middle lamella
- (d) Tertiary wall

22. The small channel that directly connect cytoplasm of neighbouring plant cells to each other are:
 (a) Plasmodesmata (b) Stomata
 (c) Golgi apparatus (d) Vacuole
23. According to fluid mosaic model proteins are:
 (a) Present outside lipid bilayer
 (b) Present towards innerside of lipid bilayer
 (c) Float in the lipid bilayer
 (d) Not present in the cell membrane
24. The glycoprotein and glycolipids on outside surface of plasma membrane are collectively called as:
 (a) Phospholipoid
 (b) Glycocalyx
 (c) Phosphoproteins
 (d) Lipoproteins
25. Scanning electron microcopy is useful for examining:
 (a) Internal structure
 (b) Internal function of cell
 (c) Surface topology of cell
 (d) Signal transmission of cell
26. X-ray crystallography is used to study:
 (a) Surface topology of cell
 (b) Create sharp and detail images
 (c) Atomic structure of membrane proteins
 (d) High resolution image of membrane
27. Three major components i.e. plasma membrane, cytoplasm and nucleus make up:
 (a) Tissue (b) Organ
 (c) Organelle (d) Cell
28. Organelles are generally enclosed by a membrane except:
 (a) Ribosomes (b) Lysosomes
 (c) Peroxisomes (d) glyoxisomes
29. The semifluid matrix found inside the nucleus is called:
 (a) Nucleolus (b) Chromosomes
 (c) Nucleoplasm (d) Cytoplasm
30. Nuclear Lamine on the innerside of a nuclear envelope is inject:
 (a) Protein (b) Lipid
 (c) Vitamin (d) Nucleotide
31. Which one is not related to the nuclear pore:
 (a) Annular subunit
 (b) Column subunit
 (c) Ribosomal subunit
 (d) Lumenal subunit
32. Nucleoli are formed at certain sites called nucleolar organizer regions found on:
 (a) Chromosomes
 (b) Nuclear membrane
 (c) Nuclear pores
 (d) Nucleoplasm
33. Granular components of nucleolus consist of:
 (a) DNA molecules
 (b) Ribosomal subunits
 (c) Centriolar subunits
 (d) Nucleolar subunits
34. A chromosome is made of chromatids and:
 (a) Centromere
 (b) Centrioles
 (c) Microfilaments
 (d) Microtubules
35. Surface of rough endoplasmic reticulum is covered with:
 (a) Centrioles (b) Nucleolus
 (c) Ribosomes (d) Nucleosome
36. Detoxification of harmful drug is function of:
 (a) Smooth endoplasmic reticules
 (b) Rough endoplasmic reticules
 (c) Cristae of mitochondria
 (d) Thylakoid of chloroplast
37. Protein production machinery is:
 (a) Lysosomes (b) Ribosomes
 (c) Glyoxisomes (d) Mitochondria

- 38. Eukaryotic rissosomes are produced and assembled in:**
 (a) Cytoplasm (b) Nucleolus
 (c) Plastids (d) Golgi apparatus
- 39. Which RNA is required for protein synthesis?**
 (a) Ribosomal RNA
 (b) Messenger RNA
 (c) Transfer RNA
 (d) All of these
- 40. Svedberg values are for which protein:**
 (a) Sedimentation
 (b) Orientation
 (c) Augmentation
 (d) Fertilization
- 41. Which is not true for eukaryotic ribosomes:**
 (a) They are involved in protein synthesis
 (b) They are produced in nucleolus
 (c) They have Svedberg value of 70S
 (d) They are composed of two subunits
- 42. F-1 particles on inner membrane of mitochondria are enzymes:**
 (a) ATP reductase
 (b) ATP synthase
 (c) Matrix catalase
 (d) Protein synthase
- 43. Mitochondria in bounded by how many membranes:**
 (a) 1 (b) 2
 (c) 3 (d) 4
- 44. Sites for cellular respiration are:**
 (a) Lungs (b) Mitochondria
 (c) Ribosomes (d) Polysome
- 45. ATP is a form of which energy:**
 (a) Physical (b) Electrical
 (c) Chemical (d) Analytical
- 46. Semifluid present inside the inner membrane space of chloroplast is called:**
 (a) Stroma (b) Matrix
 (c) Lumen (d) Thylakoid
- 47. Non-green compartments of chloroplast are:**
 (a) Leucoplast (b) Grana
 (c) Lamellae (d) Thylakoids
- 48. Which is common factor among mitochondria and chloroplast:**
 (a) Both have chlorophyll
 (b) Both have dark reactions
 (c) Both have DNA
 (d) Both have centrioles
- 49. Which organelle is involved in the processing of proteins, carbohydrates and phospholipids prepared in the cell:**
 (a) Endoplasmic reticulum
 (b) Ribosomes
 (c) Golgi apparatus
 (d) Leucoplast
- 50. In Pompe's diseases lysosome lacks:**
 (a) Glycogen -digesting enzymes
 (b) Lipids digesting enzymes
 (c) Proteins digesting enzymes
 (d) Glucose digesting enzymes
- 51. In Tay-Sachs, disease an essential enzyme is missing which digests:**
 (a) Protein (b) Starch
 (c) Lipids (d) Vitamins
- 52. Which of the following is single membrane bound organelle:**
 (a) Peroxisome
 (b) Mitochondria
 (c) Golgi apparatus
 (d) Nucleus
- 53. Zellweger syndrome is due to defect in:**
 (a) Lysosome (b) Ribosome
 (c) Peroxisome (d) Glyoxisome
- 54. The organelle found only in plants is:**
 (a) Glyoxisomes (b) Lysosomes
 (c) Ribosomes (d) Polysomes
- 55. During germination Glyoxisomes convert stored lipid into:**
 (a) Carbohydrates (b) Fats
 (c) Proteins (d) Vitamins

56. Membrane of vacuole is called:

- (a) Leucoplast (b) Tonoplast
(c) Chromoplast (d) Vacuoloplast

57. What is not true for centrioles:

- (a) Found in plants
(b) Found in protist
(c) Occur in pairs
(d) Located at right angle to each other

58. Major components of cilia and flagella are:

- (a) Intermediate filament
(b) Microtubules
(c) Microfilaments
(d) Action filaments

59. Cilia and flagella are:

- (a) Locomotory organs
(b) Excretory organ
(c) Sense organs
(d) Reproductive organ

60. The core of eukaryotic cilia and flagella is called:

- (a) Axoneme (b) Myomere
(c) Acroreme (d) Telomere

61. Basal body is present at the base of:

- (a) Chromosomes
(b) Cilia
(c) Golgi vesicles
(d) liposomes

62. Prokaryotic flagella is built from the protein:

- (a) Pillin (b) Flagellin
(c) Actin (d) Myosin

63. Genetic material of both prokaryotic and eukaryotic cell is made of:

- (a) DNA (b) RNA
(c) Protein (d) Carbohydrate

64. Nucleoid is analogous structure to:

- (a) Chromosomes (b) Nucleus
(c) Chromatid (d) Nucleolus

65. Sedimentation rate of complete ribosome of a prokaryote is:

- (a) 50S (b) 60S
(c) 70S (d) 80S

66. What is not true for prokaryotes:

- (a) They divide by binary fission
(b) Mitosis and Meiosis is present in them
(c) Their ribosomes is of 70S
(d) Have cell wall of peptidoglycan

Cell Signalling

67. Receptor on the membrane of target cell for signal reception is:

- (a) Protein (b) Lipid
(c) Nucleotide (d) Phospholipid

68. Which molecule can act as second messenger during signal transmission:

- (a) Cyclic AMP
(b) Calcium ions
(c) Inositol triphosphate
(d) All of these

69. Cell signaling pathways involve the transmissions of signals:

- (a) From cell's exterior to interior
(b) From cell's interior to exterior
(c) From one cell to nearby cells
(d) From one cell to distant cells

70. Protein or peptide signalling molecules can't pass through plasma membrane because:

- (a) They are large
(b) They are neutral
(c) They are soluble in water
(d) They are insoluble in water

71. Membrane transport mechanisms are essential processes that enable cell:

- (a) To maintain homeostasis
(b) Acquire nutrient
(c) Excretion
(d) All of these

Membrane transport mechanism

72. What is not true for facilitated diffusion

- (a) It involves transport-proteins
(b) It is from high concentration to low
(c) Energy is used in it
(d) It is passive transport

73. Which is true for channel proteins:

- (a) They are hydrophilic
- (b) They are hydrophobic
- (c) They are fatty in nature
- (d) They don't allow passage of specific ions

74. Aquaporin allows rapid transport of:

- (a) Water
- (b) Oil
- (c) Acid
- (d) Base

75. Which process is used for purification of water:

- (a) Osmosis
- (b) Reverse osmosis
- (c) Diffusion
- (d) Reverse diffusion

76. The membranes of nerve cells have carrier proteins in the form of:

- (a) $Na^+ - K^+$ pump
- (b) $Na^+ - Cl^-$ pump
- (c) $Ca^{++} - Mg^{++}$ pump
- (d) $Na^+ - S^+$ pump

77. Intake of solid material is called:

- (a) Phagocytosis
- (b) Pinocytosis
- (c) Cytokinesis
- (d) Karyokinesis

Stem Cells

78. Cholesterol circulates in our blood as

- (a) HDL
- (b) LDL
- (c) VHHL
- (d) VLDL

79. Which stem cell can differentiate into almost any cell

- (a) Totipotent
- (b) Multipotent
- (c) Pluripotent
- (d) Unipotent

80. Totipotent cell can differentiate into:

- (a) All possible cell types
- (b) Almost any cell
- (c) Few different types of cells
- (d) One kind of cell

81. Adult muscle stem cells one example of:

- (a) Totipotent
- (b) Pluripotent
- (c) Algopotent
- (d) Unipotent

82. Hematopoietic stem cells one example of:

- (a) Totipotent
- (b) Multipotent
- (c) Oligopotent
- (d) Pluripotent

83. Uses of stem cell include:

- (a) Regenerative medicine
- (b) Drug testing
- (c) Personalized medicine
- (d) All of these

84. Inner cell mass of blastocysts are:

- (a) Embryonic stem cell
- (b) Adult stem cell
- (c) Induced pluripotent stem cell
- (d) Unipotent stem cell

85. Which of the following has ethical controversies?

- (a) Induced pluripotent stem cells
- (b) Embryonic stem cell
- (c) Adult stem cell
- (d) Unipotent stem cell

ANSWER KEY

1.	c	2.	d	3.	b	4.	a	5.	c	6.	d	7.	b
8.	b	9.	b	10.	d	11.	d	12.	b	13.	a	14.	d
15.	c	16.	b	17.	c	18.	a	19.	a	20.	a	21.	b
22.	a	23.	c	24.	b	25.	c	26.	c	27.	d	28.	a
29.	c	30.	a	31.	c	32.	a	33.	b	34.	a	35.	c
36.	a	37.	b	38.	b	39.	d	40.	a	41.	c	42.	b
43.	b	44.	b	45.	c	46.	a	47.	a	48.	c	49.	c
50.	a	51.	c	52.	a	53.	c	54.	a	55.	a	56.	b

57.	a	58.	b	59.	a	60.	a	61.	b	62.	b	63.	a
64.	b	65.	c	66.	b	67.	a	68.	d	69.	a	70.	c
71.	d	72.	c	73.	a	74.	a	75.	b	76.	a	77.	a
78.	b	79.	a	80.	a	81.	d	82.	b	83.	d	84.	a
85.	b												



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