Cell - The Unit of Life

Question1

Match List-I with List-II:

	List-I		List-II
A.	Fleming	I.	Disc shaped sacs or cisternae near cell nucleus
B.	Robert Brown	II.	Chromatin
C.	George Palade	III.	Ribosomes
D.	Camillo Golgi	IV.	Nucleus

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-II, B-IV, C-III, D-I

B.

A-II, B-III, C-I, D-IV

C.

A-I, B-II, C-III, D-IV

D.

A-IV, B-II, C-III, D-I

Answer: A

Solution:

• Nucleus as a cell organelle was first described by Robert Brown as early as 1831 .

• Later the material of the nucleus stained by the basic dyes was given the name chromatin by Flemming.

• Ribosomes are the granular structure first observed under the microscope as dense particle by George Palade.

• Camillo Golgi first observed densely stained reticular structure near the nucleus. It consist of many disc shaped sac or cisternae.

Hence, A-II, B-IV, C-III, D-I is correct.

Question2

Mesosome in a cell is a :

[NEET 2024 Re]

Options:

A.

Membrane bound vesicular structure

B.

Chain of many ribosomes attached to a single mRNA

C.

Special structure formed by extension of plasma membrane

D.

Medium sized chromosome

Answer: C

Solution:

Mesosomes are formed by the extensions of plasma membrane into the cell. Thus, option (3) is correct.

Lysosomes are membrane bound vesicular structures. Thus, option (1) is incorrect.

Several ribosomes may attach to a single mRNA and form a chain called polyribosomes. Thus, option (2) is incorrect.

Question3

Match List-I with List-II:

	List-I		List-II
A.	Histones	I	Loosely packed chromatin
B.	Nucleosome	II	Densely packed Chromatin
C.	Euchromatin	III	Positively charged basic proteins
D.	Heterochromatin	IV	DNA wrapped around histone octamer

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-IV, B-III, C-II, D-I

B.

A-III, B-I, C-IV, D-II

C.

A-II, B-III, C-IV, D-I

D.

A-III, B-IV, C-I, D-II

Answer: D

Solution:

Histones → Positively charged basic proteins

Nucleosome → DNA wrapped around histone octamer

Euchromatin → Loosely packed chromatin

Heterochromatin → Densely packed chromatin

Hence the correct answer is option (4).

Question4

Which of the following statements is correct about the type of junction and their role in our body?

[NEET 2024 Re]

Options:

A.

Adhering junctions facilitate the cells to communicate with each other.

B.

Tight junctions help to stop substances from leaking across a tissue.

C.

Tight junctions help to perform cementing to keep neighbouring cells together.

D.

Gap junctions help to create gap between the cells and tissues.

Answer: B

Solution:

The correct answer is option (2), because tight junctions help to stop substances from leaking across a tissue.

Options (1), (3) and (4) are incorrect because

• Adhering junctions perform cementing to keep neighbouring cells together.

• Gap junctions facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells for rapid transfer of ions, small molecules and sometimes big molecules.

Question5

Match List-I with List-II.

	List-I		List-II
A.	F1 Particles	I	Chromosomes
B.	Histones	II	Cilia
C.	Axoneme	III	Golgi apparatus
D.	Cisternae	IV	Mitochondria

Choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

A-II, B-I, C-IV, D-III

B.

A-IV, B-I, C-II, D-III

C.

A-IV, B-I, C-III, D-II

D.

A-IV, B-III, C-I, D-II

Answer: B

Solution:

F_1 particles or oxysomes are found on the inner face of the inner membrane of mitochondria.

Chromatin fibres condenses to form chromosomes.

Chromatin is essentially composed of DNA and basic histone proteins.

Core of cilia is known as axoneme.

In golgi complex cisternae are sac like structure.

A-IV, B-I, C-II, D-III

Question6

Given below are two statements:

Statement I: Concentrically arranged cisternae of Golgi complex are arranged near the nucleus with distinct convex cis or maturing and concave trans or forming face.

Statement II: A number of proteins are modified in the cisternae of Golgi complex before they are released from cis face.

In the light of the above statements, choose the correct answer from the option given below.

[NEET 2024 Re]

Options:

A.

Statement I is true but Statement II is false.

B.

Statement I is false but Statement II is true.

C.

Both Statement I and Statement II are true

D.

Both Statement I and Statement II are false

Answer: D

Solution:

The Golgi cisternae are concentrically arranged near the nucleus with distinct convex cis or the forming face and concave trans or the maturing face.

A number of proteins synthesised by ribosomes on the endoplasmic reticulum are modified in the cisternae of the Golgi apparatus before they are released from its trans face.

Hence the correct answer is option (4).

Question7

Match List I with List II

	List-I		List-II
A.	Nucleolus	I.	Site of formation of glycolipid
B.	Centriole	II.	Organization like the cartwheel
C.	Leucoplasts	III.	Site for active ribosomal RNA synthesis
D.	Golgi apparatus	IV.	For storing nutrients

Choose the correct answer from the options given below:

[NEET 2024]

Options:

A.

A-III, B-II, C-IV, D-I

B.

A-II, B-III, C-I, D-IV

C.

A-III, B-IV, C-II, D-I

D.

A-I, B-II, C-III, D-IV

Answer: A

Solution:

• Nucleolus is a site for active ribosomal RNA synthesis

• Both the centrioles in a centrosome lie perpendicular to each other in which each has an organisation like the cartwheel.

• Leucoplasts are the colourless plastids of varied shapes and sizes with stored nutrients.

• Golgi apparatus is the important site for formation of glycoproteins and glycolipids.

Question8

The DNA present in chloroplast is:

[NEET 2024]

Options:

A.

Linear, double stranded

B.

Circular, double stranded

C.

Linear, single stranded

D.

Circular, single stranded

Answer: B

Solution:

The DNA present in chloroplast is circular double stranded.

Question9

Match List I with List II :

	List-I		List-II
A.	Axoneme	I.	Centriole
B.	Cartwheel pattern	II.	Cilia and flagella
C.	Crista	III.	Chromosome
D.	Satellite	IV.	Mitochondria

Choose the correct answer from the options given below :

[NEET 2024]

Options:

A.

A-IV, B-III, C-II, D-I

B.

A-IV, B-II, C-III, D-I

C.

A-II, B-IV, C-I, D-III

D.

A-II, B-I, C-IV, D-III

Answer: D

Solution:

• Axoneme is seen in cilia and flagella

• Centriole shows cartwheel appearance

• Crista is found in mitochondria

• Satellite is present in chromosomes

Question10

Given below are two statements:
Statement I: Mitochondria and chloroplasts both double membranes bound organelles.
Statement II: Inner membrane of mitochondria is relatively less permeable, as compared chloroplast.

In the light of the above statements, choose the mis appropriate answer from the options given below:

[NEET 2024]

Options:

A.

Both Statement I and Statement II are correct.

B.

Both Statement I and Statement II are incorrect.

C.

Statement I is correct but Statement II is incorrect.

D.

Statement I is incorrect but Statement II is correct.

Answer: C

Solution:

Both mitochondria and chloroplasts are double membrane bound cell organelles.

Transport of ions occurs across the inner membrane of mitochondria. The inner membrane of chloroplast is impermeable to ions and metabolites. Therefore, it is said that inner membrane of mitochondria is relatively more permeable to that of chloroplast.

Question11

How many different proteins does the ribosome consist of?

[NEET 2023]

Options:

A.

60

B.

40

C.

20

D.

80

Answer: D

Solution:

The ribosome consists of structural RNAs and about 80 different proteins.

Question12

Which of the following are NOT considered as the part of endomembrane system?
A. Mitochondria
B. Endoplasmic reticulum
C. Chloroplasts
D. Golgi complex
E. Peroxisomes
Choose the most appropriate answer from the options given below:

[NEET 2023]

Options:

A.

A, C and E only

B.

A and D only

C.

A, D and E only

D.

B and D only

Answer: A

Solution:

Solution:

The endomembrane system include endoplasmic reticulum (ER), golgi complex, lysosomes and vacuoles.

Since the functions of the mitochondria, chloroplast and peroxisomes are not coordinated with the above components, these are not considered as part of endomembrane system.

Question13

Which of the following functions is carried out by cytoskeleton in a cell?

[NEET 2023]

Options:

A.

Protein synthesis

B.

Motility

C.

Transportation

D.

Nuclear division

Answer: B

Solution:

An elaborate network of filamentous proteinaceous structures consisting of microtubules, microfilaments and intermediate filaments present in cytoplasm is collectively referred to as the cytoskeleton.

It is involved in many functions such as mechanical support, motility, maintenance of the shape of the cell.

Question14

Given below are two statements:

Statement I :-
In bacteria, the mesosomes are formed by the extensions of plasma membrane.

Statement II :-
The mesosomes, in bacteria, help in DNA replication and cell wall formation.
In the light of the above statements, choose the most appropriate answer from the options given below:

[NEET 2023 mpr]

Options:

A.

Statement I is correct but Statement II is incorrect.

B.

Statement I is incorrect but Statement II is correct.

C.

Both Statement I and Statement II are correct.

D.

Both Statement I and Statement II are incorrect.

Answer: C

Solution:

Here's why :

Statement I : In bacteria, the mesosomes are indeed formed by the extensions of the plasma membrane into the cytoplasm. They are typically observed as invaginations of the plasma membrane.

Statement II : Mesosomes in bacteria are thought to assist in several cellular processes including DNA replication, distribution of DNA during cell division, respiration, and cell wall formation. Hence, this statement is also correct.

Question15

Select correct sequence of substages of Prophase-I of Meiotic division :
(A) Zygotene
(B) Pachytene
(C) Diakinesis
(D) Leptotene
(E) Diplotene
Choose the correct answer from the options given below :

[NEET 2023 mpr]

Options:

A.

(D),(B),(A),(E),(C)

B.

(A),(B),(D),(E),(C)

C.

(D),(A),(B),(E),(C)

D.

(A), (D), (B), (C), (E)

Answer: C

Solution:

Leptotene (D) : This is the first stage of Prophase I. During this stage, the chromosomes begin to condense and become visible under a microscope.

Zygotene (A) : In this stage, homologous chromosomes begin to pair up, a process known as synapsis. This pairing forms structures known as bivalents or tetrads, which allow for crossing-over (exchange of genetic material) to occur.

Pachytene (B) : This is the stage when crossing-over occurs. Recombination nodules appear where the crossing-over has occurred. These are the physical manifestation of genetic recombination, which increases genetic diversity.

Diplotene (E) : At this point, the homologous chromosomes begin to separate, but remain attached at points called chiasmata. This separation of chromosomes is called desynapsis.

Diakinesis (C) : This is the final stage of Prophase I. The chiasmata move to the ends of the chromosomes, and the nuclear membrane breaks down, signaling the end of Prophase I.

So, the correct order of the stages is: Leptotene, Zygotene, Pachytene, Diplotene, and Diakinesis. Hence, the correct answer is Option C: (D), (A), (B), (E), (C).

Question16

Which of the following statements are correct with respect of Golgi apparatus?
(A) It is the important site of formation of glycoprotein and glycolipids.
(B) It produces cellular energy in the form of ATP.
(C) It modifies the protein synthesized by ribosomes on ER.
(D) It facilitates the transport of ions.
(E) It provides mechanical support.

Choose the most appropriate answer from the options given below :

[NEET 2023 mpr]

Options:

A.

(B) and (C) only

B.

(A) and (C) only

C.

(A) and (D) only

D.

(D) and (E) only

Answer: B

Solution:

The Golgi apparatus, sometimes called the Golgi body or Golgi complex, plays a critical role in the processing and packaging of proteins and lipids following their synthesis in the endoplasmic reticulum. It also has a role in the formation of glycoproteins and glycolipids.

So, among the given statements :
(A) It is the important site of formation of glycoprotein and glycolipids - This statement is correct.
(B) It produces cellular energy in the form of ATP - This statement is incorrect. The mitochondria, not the Golgi apparatus, are responsible for the production of ATP.
(C) It modifies the protein synthesized by ribosomes on ER - This statement is correct. The Golgi apparatus modifies and packages proteins received from the ER.
(D) It facilitates the transport of ions - This statement is not generally correct. Ion transport is primarily facilitated by the plasma membrane and ion channels.
(E) It provides mechanical support - This statement is incorrect. While the Golgi apparatus does help maintain cellular structure to a degree, its main role is in processing and packaging substances, not providing mechanical support.

So the most appropriate answer from the options given would be Option B : (A) and (C) only.

Question17

If the pH in lysosomes is increased to alkaline, what will be the outcome?
[NEET Re-2022]

Options:

A. Lysosomal enzymes will be more active

B. Hydrolytic enzymes will function more efficiently

C. Hydrolytic enzymes will become inactive

D. Lysosomal enzymes will be released into the cytoplasm

Answer: C

Solution:

Solution:

Lysosomal enzymes are activated at acidic pH only and get deactivated at alkaline pH.

Question18

Match List-I with List-II.

List-I	List-II
(a) Metacentric chromosome	(i) Centromere situated close to the end forming one extremely short and one very long arms
(b) Acrocentric chromosome	(ii) Centromere at the terminal end
(c) Submetacentric	(iii) Centromere in the middle forming two equal arms of chromosomes
(d) Telocentric chromosome	(iv) Centromere slightly away from the middle forming one shorter arm and one longer arm

Choose the correct answer from the options given below :
[NEET-2022]

Options:

A. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

B. (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

C. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

D. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

Answer: A

Solution:

In metacentric chromosome, centromere is in the middle of the chromosomes. Acrocentric chromosome has centromere close to the end of the chromosome. In submetacentric chromosome,centromere is slightly away from the middle of the chromosome. Telocentric chromosome has terminal centromere.

Question19

Which of the following statements with respect to Endoplasmic Reticulum is incorrect?
[NEET-2022]

Options:

A. RER has ribosomes attached to ER

B. SER is devoid of ribosomes

C. prokaryotes only RER are present In

D. SER are the sites for lipid synthesis

Answer: C

Solution:

Solution:

In prokaryotes, ER is absent be it RER or SER.

Question20

When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as :
[NEET 2021]

Options:

A. Metacentric

B. Telocentric

C. Sub-metacentric

D. Acrocentric

Answer: A

Solution:

When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as Metacentric.
When the centromere is present slightly away from the middle, it is called sub-metacentric chromosome.

When the centromere is present very close to one end of the chromosome, it is called acrocentric chromosome.
When the centromere is present at terminal position, the chromosome is called telocentric.

Question21

Match List-I with List-II.

	List-I		List-II
(a)	Cristae	(i)	Primary constriction in chromosome
(b)	Thylakoids	(ii)	Disc-shaped sacs in Golgi apparatus
(c)	Centromere	(iii)	Infoldings in mitochondria
(d)	Cisternae	(iv)	Flattened membranous sacs in stroma of plastids

Choose the correct answer from the options given below. [NEET 2021]

Options:

A. (a)-(iv) (b)-(iii) (c)-(ii) (d)-(i)

B. (a)-(i) (b)-(iv) (c)-(iii) (d)-(ii)

C. (a)-(iii) (b)-(iv) (c)-(i) (d)-(ii)

D. (a)-(ii) (b)-(iii) (c)-(iv) (d)-(i)

Answer: C

Solution:

Solution:
• The inner membrane of mitochondria forms infoldings called cristae.
• Thylakoids are flattened membranous sacs in stroma of plastids.
• Cisternae are disc shaped sacs in Golgi apparatus.
• Primary constriction in chromosome that holds two chromatids together is called centromere.
Hence correct option is (3)- a(iii), b(iv), c(i), d(ii)

Question22

Which of the following is an incorrect statement? [NEET 2021]

Options:

A. Mature sieve tube elements possess a conspicuous nucleus and usual cytoplasmic organelles

B. Microbodies are present both in plant and animal cells

C. The perinuclear space forms a barrier between the materials present inside the nucleus and

that of the cytoplasm

D. Nuclear pores act as passages for proteins and RNA molecules in both directions between nucleus and cytoplasm

Answer: A

Solution:

A mature sieve tube elements possess a peripheral cytoplasm and a large central vacuole but lacks a nucleus.
Rest of other statements are correct.

Question23

The organelles that are included in the endomembrane system are [NEET 2021]

Options:

A. Endoplasmic reticulum, Mitochondria, Ribosomes and Lysosomes

B. Endoplasmic reticulum, Golgi complex, Lysosomes and Vacuoles

C. Golgi complex, Mitochondria, Ribosomes and Lysosomes

D. Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes

Answer: B

Solution:

- Endomembrane system consist of endoplasmic reticulum, Golgi complex, vacuoles and lysosomes.
- Mitochondria is semi-autonomous cell organelle.
- Ribosome is non-membranous cell organelle.

Question24

Which of the following statements about inclusion bodies is incorrect? [2020]

Options:

A. These are involved in ingestion of food particles

B. They lie free in the cytoplasm

C. These represent reserve material in cytoplasm

D. They are not bound by any membrane

Answer: A

Solution:

(a) Inclusion bodies are nuclear or cytoplasmic aggregates which are stainable substances, usually proteins, and formed due to viral multiplication or genetic disorders in human beings these bodies are either intracellular or extracellular abnormalities and they are specific to certain diseases. These are not involved in ingestion of food particles.
Hereditary inclusion body myopathies (hIBM) are a rare group of genetic muscle disorders. As with individuals with sIBM, the muscle tissue of affected individuals contains numerous sub-cellular compartments called vacuoles. The age of onset of these disorders is generally between 20 and 40 years of age.

Question25

Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?
[2020]

Options:

A. Peroxisomes

B. Golgi bodies

C. Polysomes

D. Endoplasmic reticulum

Answer: B

Solution:

Solution:
(b) Golgi bodies are site of formation of glycoproteins and glycolipids in eukaryotic cells.
Glycolipids are lipids with a carbohydrate attached by a glycosidic (covalent) bond. Their role is to maintain the stability of the cell membrane and to facilitate cellular recognition, which is crucial to the immune response and in the connections that allow cells to connect to one another to form tissues.

Question26

Which of the following nucleic acids is present in an organism having 70S ribosomes only?
[2019]

Options:

A. Double stranded circular DNA with histone proteins.

B. Single stranded DNA with protein coat.

C. Double stranded circular naked DNA.

D. Double stranded DNA enclosed in nuclear membrane.

Answer: C

Solution:

(c) The organisms which have ribosomes of 70S type are prokaryotes. Prokaryotes have double stranded DNA which is not enclosed in membrane.

Question27

Match the column I with column II.

Column I	Column II
(a) Golgi apparatus	(i) Synthesis of protein
(b) Lysosomes	(ii) Trap waste and excretory products
(c) Vacuoles	(iii) Formation of glycoproteins and glycolipids
(d) Ribosomes	(iv) Digesting biomolecules

Choose the right match from options given below: [2019]

Options:

A. (a)-(i), (B)-(ii), (C)-(iv), (D)-(iii)

B. (a)-(iii), (B)-(iv), (C)-(ii), (D)-(i)

C. (a)-(iv), (B)-(iii), (C)-(i), (D)-(ii)

D. (a)-(iii), (B)-(ii), (C)-(iv), (D)-(i)

Answer: B

Solution:

Golgi apparatus is involved in the formation of glycoproteins and glycolipids.
Lysosomes are membrane enclosed organelle. It contains digestive enzymes, which digest excess or worn out organelles, food particles etc.
Vacuoles is a membrane enclosed fluid filled sac which traps waste and excretory products.
Ribosomes is a minute particle consisting of RNA and associated proteins. They bind mRNA and tRNA to synthesise polypeptides and proteins.

Question28

Which of the following cell organelles is present in the highest number in secretory cells?
(2019)

Options:

A. Lysosome

B. Mitochondria

C. Golgi complex

D. Endoplasmic reticulum

Answer: C

Solution:

Solution:
(c) The important function of Golgi apparatus is to process, package and transport the materials for secretion. Therefore secretory cells have Golgi apparatus in highest number.

Question29

Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?
NEET 2017

Options:

A. Ribosome

B. Chloroplast

C. Mitochondrion

D. Lysosome

Answer: C

Solution:

Solution:
(c) : Mitochondria are miniature biochemical factories where food stuffs or respiratory substrates are completely oxidised to carbon dioxide and water. The energy liberated in the process is initially stored in the form of reduced coenzymes and reduced prosthetic groups. The latter soon undergo oxidation and form energy rich ATP. ATP comes out of mitochondria and helps perform various energy requiring processes of the cell like muscle contraction, nerve impulse conduction, biosynthesis, membrane transport, cell division, movement, etc. Because of the formation of ATP, the mitochondria are called power houses of the cell.

Question30

Select the mismatch.
NEET II 2016

Options:

A. Gas vacuoles - Green bacteria

B. Large central vacuoles - Animal cells

C. Protists - Eukaryotes

D. Methanogens - Prokaryotes

Answer: B

Solution:

Solution:
(b) : Large central vacuole is the characteristic of plant cell, not animal cell which may have many small scattered vacuoles.

Question31

Select the wrong statement.
NEET II 2016

Options:

A. Bacterial cell wall is made up of peptidoglycan.

B. Pili and fimbriae are mainly involved in motility of bacterial cells.

C. Cyanobacteria lack flagellated cells.

D. Mycoplasma is a wall-less microorganism.

Answer: B

Solution:

Solution:
(b) : Pili and fimbriae are bacterial appendages which are not involved in locomotion. Actually, pili are long fewer and thicker tubular outgrowths which develop in response to F^+ or fertility factor in Gram negative bacteria. Being long they are helpful in attaching to recipient cell and forming conjugation tube. Fimbriae are small bristle-like fibres sprouting from cell surface in large number. There are $300-400$ of them per cell. They are involved in attaching bacteria to solid surfaces.

Question32

A cell organelle containing hydrolytic enzymes is
NEET II 2016

Options:

A. lysosome

B. microsome

C. ribosome

D. mesosome.

Answer: A

Solution:

Solution:
(a) : Lysosomes are small vesicles which are bounded by a single membrane and contain hydrolytic enzymes in the form of minute crystalline or semicrystalline granules of 5-8 nm. About 50 enzymes have been recorded to occur in them. All the enzymes do not occur in the same lysosome but there are different sets of enzymes in different types of lysosomes. The important enzymes are acid phosphatases, sulphatases, proteases, peptidases, nucleases, lipases and carbohydrases. They are also called acid hydrolases because these digestive enzymes usually function in acidic medium or pH of 4-5

Question33

Mitochondria and chloroplast are
(A) semi-autonomous organelles
(B) formed by division of pre-existing organelles and they contain DNA but lack protein synthesising machinery.

Which one of the following options is correct?
NEET I 2016

Options:

A. (A) is true but (B) is false.

B. Both (A) and (B) are false.

C. Both (A) and (B) are correct.

D. (B) is true but (A) is false.

Answer: A

Solution:

Solution:
(a) : Both mitochondria and chloroplast are semiautonomous organelles. They have their own DNA which produces its own, mRN A, tRN A and rRN A. These organelles also possess their own ribosomes and hence are able to synthesise

some of their proteins.

Question34

Microtubules are the constituents of
NEET I 2016

Options:

A. centrioles, spindle fibres and chromatin

B. centrosome, nucleosome and centrioles

C. cilia, flagella and peroxisomes

D. spindle fibres, centrioles and cilia.

Answer: D

Solution:

Solution:
(d) : Microtubules are unbranched hollow submicroscopic tubules of protein tubulin which develop on specific nucleating regions. It can undergo quick growth or dissolution at their ends by assembly or disassembly of monomers. They are present in the cytoplasm as well as in specialised structures like centrioles, basal bodies, cilia or flagella, sensory hair, equatorial ring of thrombocytes, spindle apparatus, chromosome fibres, nerve processes, sperm tails, axostyle of parasitic flagellates, fibre system of Stentor, cyto-pharyngeal basket of Nassula, etc.

Question35

Which one of the following cell organelles is enclosed by a single membrane?
NEET I 2016

Options:

A. Lysosomes

B. Nuclei

C. Mitochondria

D. Chloroplasts

Answer: A

Solution:

Solution:
(a) : Lysosomes are small yesicles bounded by a single membrane and contain hydrolytic enzymes. Nucleus,

mitochondria and chloroplasts are double membrane bound cells organelles.

Question36

Match the columns and identify the correct option.

	Column I	Column II
A.	Thylakoids	(i) Disc-shaped sacs in Golgi apparatus
B.	Cristae	(ii) Condensed structure of DNA
C.	Cisternae	(iii) Flat membranous sacs in stroma
D.	Chromatin	(iv) Infoldings in mitochondria

NEET 2015

Options:

A. A − (iii), B − (i), C − (iv), D − (ii)

B. A − (iii), B − (iv), C − (ii), D − (i)

C. A − (iv), B − (iii), C − (i), D − (ii)

D. A − (iii), B − (iv), C − (i), D − (ii)

Answer: D

Question37

Which of the following structures is not found in a prokaryotic cell? NEET 2015

Options:

A. Mesosome

B. Plasma membrane

C. Nuclear envelope

D. Ribosome

Answer: C

Solution:

(c) : A prokaryotic cell is characterised by absence of an organised nucleus and membrane bound cell organelles. DNA is naked i.e., without a nuclear envelope and lies variously coiled in the cytoplasm. It is commonly called nucleoid or genophore. Mesosomes, plasma membrane and 70 S ribosomes are present in a prokaryotic cell.

Question38

Cellular organelles with membranes are
NEET 2015

Options:

A. endoplasmic reticulum, ribosomes and nuclei

B. lysosomes, Golgi apparatus and mitochondria

C. nuclei, ribosomes and mitochondria

D. chromosomes, ribosomes and endoplasmic reticulum.

Answer: B

Solution:

Solution:
(b) : Endoplasmic reticulum, nuclei, lysosomes, Golgi apparatus and mitochondria are membrane bound cell organelles whereas ribosomes are naked ribonucleoprotein protoplasmic particles. Chromosomes are the hereditary particles present in the nucleus.

Question39

Which of the following are not membrane bound?
NEET 2015

Options:

A. Lysosomes

B. Mesosomes

C. Vacuoles

D. Ribosomes

Answer: D

Solution:

(d) : Endoplasmic reticulum, nuclei, lysosomes, Golgi apparatus and mitochondria are membrane bound cell organelles whereas ribosomes are naked ribonucleoprotein protoplasmic particles. Chromosomes are the hereditary particles

present in the nucleus.

Question40

DNA is not present in
NEET 2015 Cancelled

Options:

A. nucleus

B. mitochondria

C. chloroplast

D. ribosomes.

Answer: D

Solution:

Solution:
(d) : Ribosome is a small spherical body within a living cell that is the site of protein synthesis. Ribosomes consist of two subunits, one large and one small, each of which comprises some RNA (called ribosomal RNA) and protein. They do not have any DNA.

Question41

Nuclear envelope is a derivative of
NEET 2015 Cancelled

Options:

A. microtubules

B. rough endoplasmic reticulum

C. smooth endoplasmic reticulum

D. membrane of Golgi complex.

Answer: B

Solution:

(b) : Recent developments have shown that nuclear membrane is derived from rough endoplasmic reticulum. During cell division, nuclear membrane is disintegrated. The nuclear envelope transmembrane proteins are absorbed in the RER. Once the division is completed, RER reassembles the nuclear envelope.

Question42

The structures that are formed by stacking of organised flattened membranous sacs in the chloroplasts are
NEET 2015 Cancelled

Options:

A. stroma lamellae

B. stroma

C. cristae

D. grana.

Answer: D

Solution:

Solution:
(d) : A chloroplast is a vesicle, bound by an envelope of two unit membranes and filled with a fluid matrix called stroma. The lamellae, after separation from the inner membrane, usually take the form of closed, flattened, ovoid sacs, the thylakoids, which lie closely packed in piles, the grana.

Question43

Select the correct matching in the following pairs.
NEET 2015 Cancelled

Options:

A. Rough ER - Synthesis of glycogen

B. Rough ER - Oxidation of fatty acids

C. Smooth ER - Oxidation of phospholipids

D. Smooth ER - Synthesis of lipids

Answer: D

Solution:

(d) : Smooth endoplasmic reticulum (SER) is a system of smooth membranes (i.e., membranes not having ribosomes) within the cytoplasm of plant and animal cells. It forms a link between the cell and nuclear membranes. It is the site of important metabolic reactions, including phospholipid and fatty acid synthesis. In animal cells lipid-like steroidal hormones are also synthesized.

Question44

The chromosomes in which centromere is situated close to one end are
NEET 2015 Cancelled

Options:

A. telocentric

B. sub-metacentrio

C. metacentric

D. acrocentric

Answer: D

Solution:

Solution:
(d) : Centromere is a part of a chromosome that attaches to the spindle during cell division. A chromosome with the centromere close to one end is acrocentric.

Question45

Which one of the following is not an inclusion body found in prokaryotes?
NEET 2015 Cancelled

Options:

A. Glycogen granule

B. Polysome

C. Phosphate granule

D. Cyanophycean granule

Answer: B

Solution:

Solution:
(b) : Polysome is a not an inclusion body. It is an aggregation of ribosomes formed under conditions of high concentration of magnesium. An inclusion body is any of various particulate structures, usually proteins, formed after viral infections in a prokaryotic or eukaryotic cell.

Question46

The solid linear cytoskeletal elements having a diameter of 6 mathrm nm and made up of a single type of monomer are known as
NEET 2014

Options:

A. microtubules

B. microfilaments

C. intermediate filaments

D. lamins.

Answer: B

Solution:

Solution:
(b) : Microtubules are hollow microscopic tubular structures with an external diameter of 24 nm and of variable length. They are composed of tubulin. Intermediate filaments are the numerous microscopic protein fibres of about 10 nm thickness that form part of the cytoskeleton. They are made up of a variety of proteins e.g. keratin in nails.

Question47

The osmotic expansion of a cell kept in water is chiefly regulated by NEET 2014

Options:

A. mitochondria

B. vacuoles

C. plastids

D. ribosomes.

Answer: B

Solution:

(b) : Vacuoles are non cytoplasmic areas present inside cytoplasm and separated from latter by tonoplast. They are believed to be formed by expansion and pinching off from ER. There occurs a large central vacuole and many small vacuoles in plant cells. They play a major role in osmotic expansion of cell.

Question48

Match the following and select the correct answer.

(A) Centriole	(i) Infoldings in mitochondria
(B) Chlorophyll	(ii) Thylakoids
(C) Cristae	(iii) Nucleic acids
(D) Ribozymes	(iv) Basal body of cilia or flagella

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

NEET 2014

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Question49

The Golgi complex plays a major role
NEET 2013

Options:

A. as energy transferring organelles

B. in post translational modification of proteins and glycosylation of lipids

C. in trapping the light and transforming it into chemical energy

D. in digesting proteins and carbohydrates.

Answer: B

Solution:

(b) : Post translational modification (PTM) is a step in protein biosynthesis. Proteins are created on ribosomes translating mRNA into polypeptide chains. These polypeptide chains undergo PTM, such as folding, cutting and other processes, before becoming the mature protein product. Proteins synthesized by the rough endoplasmic reticulum and lipids synthesized by smooth endoplasmic reticulum reach the cisternae of the Golgi apparatus. Here, they combine with carbohydrates to form glycoproteins and glycolipids. This process is called glycosylation.

Question50

Which one of the following organelle in the figure correctly matches with its function?

NEET 2013

Options:

A. Golgi apparatus, formation of glycolipids

B. Rough endoplasmic reticulum, protein synthesis

C. Rough endoplasmic reticulum, formation of glycoproteins

D. Golgi apparatus, protein synthesis

Answer: B

Solution:

Solution:
(b) : The given figure shows endoplasmic reticulum bearing ribosomes on their surface. It is called rough endoplasmic reticulum or RER. RER is actively involved in protein synthesis and secretion.

Question51

A major site for synthesis of lipids is
NEET 2013

Options:

A. symplast

B. nucleoplasm

C. RER

D. SER.

Answer: D

Solution:

Solution:
(d) : Smooth endoplasmic reticulum (SER) is a system of smooth membranes (i.e., membranes not having ribosomes) within the cytoplasm of plant and animal cells. It forms a link between the cell andnuclear membranes. It is the site of important metabolic reactions, including phospholipid and fatty acid synthesis. In animal cells lipid-like steroidal hormones are also synthesized.

Question52

The term 'glycocalyx' is used for
KN NEET 2013

Options:

A. a layer present between cell wall and membrane of bacteria

B. cell wall of bacteria

C. bacterial cell glyco-engineered to possess N-glycosylated proteins

D. a layer surrounding the cell wall of bacteria.

Answer: D

Solution:

Solution:
(d) : Glycocalyx is a sticky, gelatinous material that collects outside the cell wall of bacteria to form an additional surface layer. When this layer is firmly attached to the surface of the cell, it is called a capsule. If it is loosely distributed around the cell, the glycocalyx is called a slime layer.

Question53

Which of the following types of plastid does not contain stored food material?
KN NEET 2013

Options:

A. Chromoplasts

B. Elaioplasts

C. Aleuroplasts

D. Amyloplasts

Answer: A

Solution:

Solution:
(a) : Chromoplasts are yellow or reddish in colour because of the presence of carotenoid pigments. They do not contain stored food material. Chromoplasts are formed either from leucoplasts or chloroplasts. Chromoplasts provide colour to many flowers for attracting pollinating insects. They provide bright red or orange colour to fruits for attracting animals for dispersal.

Question54

Which of the following best illustrates "feedback" in development? KN NEET 2013

Options:

A. Tissue X secretes RNA which changes the development of tissue Y.

B. As tissue X develops, it secretes enzymes that inhibit the development of tissue Y.

C. As tissue X develops, it secretes something that induces tissue Y to develop.

D. As tissue X develops, it secretes something that slows down the growth of tissue Y.

Answer: C

Solution:

Solution:
(c) : As tissue X develops it secretes something that induces tissue Y to develop indicating positive feedback mechanism.

Question55

Select the alternative giving correct identification and function of the organelle 'A' in the diagram.

KN NEET 2013

Options:

A. Mitochondria - Produce cellular energy in the form of ATP

B. Golgi body - Provides packaging material

C. Lysosomes - Secrete hydrolytic enzymes

D. Endoplasmic reticulum - Synthesis of lipids

Answer: A

Solution:

Solution:
(a) : Mitochondria are miniature biochemical factories where food stuffs or respiratory substrates are completely oxidised to carbon dioxide and water. The energy liberated in the process is initially stored in the form of reduced coenzymes and reduced prosthetic groups. The latter soon undergo oxidation and form energy rich ATP. ATP comes out of mitochondria and helps perform various energy requiring processes of the cell like muscle contraction, nerve impulse conduction, biosynthesis, membrane transport, cell division, movement, etc. Because of the formation of ATP, the mitochondria are called power houses of the cell.

Question56

Select the correct statement from the following regarding cell membrane.
2012

Options:

A. Na^{+} and K^{+} ions move across cell membrane by passive transport.

B. Proteins make up 60 to 70% of the cell membrane.

C. Lipids are arranged in a bilayer with polar heads towards the inner part.

D. Fluid mosaic model of cell membrane was proposed by singer and Nicolson.

Answer: D

Solution:

(d) : According to the fluid mosaic model of cell membrane structure proposed by singer and Nicolson (1972) plasma membrane contains about $50-60\%$ proteins and $50-40\%$ lipids. Lipids form a bilayer with hydrophilic heads pointing outwards. Cell membrane allows transport of some molecules by passive transport eg., water, neutral solutes while some are transported actively $\mathrm{e.g.,\ Na^{+}\ /\ K^{+}}$ pump.

Question57

What is true about ribosomes?
2012

Options:

A. The prokaryotic ribosomes are 80S, where "S" stands for sedimentation coefficient.

B. These are composed of ribonucleic acid and proteins.

C. These are found only in eukaryotic cells.

D. These are self-splicing introns of some RNAs.

Answer: B

Solution:

Solution:
(d) : Ribosome is a small spherical body within a living cell that is the site of protein synthesis. Ribosomes consist of two subunits, one large and one small, each of which comprises some RNA (called ribosomal RNA) and protein. They do not have any DNA.

Question58

Which one of the following does not differ in E.coli and Chlamydomonas?
2012

Options:

A. Ribosomes

B. Chromosomal organization

C. Cell wall

D. Cell membrane

Answer: D

Solution:

(d) : E.coli (bacteria) is a prokaryote while Chlamydomonas (algae) is a eukaryote. Ribosomes of both groups differ being 70S in prokaryotes and 80S in eukaryotes. Prokaryotic chromosomes lack histone protein unlike eukaryotic ones. Cell wall organization also differs as bacterial cell wall is rich in muramic acid while algal cell wall is cellulosic. It is the cell membrane which has similar organization in both the groups.

Question59

Which one of the following cellular parts is correctly described?
Mains 2012

Options:

A. Thylakoids - flattened membranous sacs forming the grana of chloroplasts

B. Centrioles - sites for active RNA synthesis

C. Ribosomes - those on chloroplasts are larger (80S) while those in the cytoplasm are smaller (70S)

D. Lysosomes - optimally active at a pH of about 8.5

Answer: A

Solution:

Solution:
(a) : Thylakoid are the flattened sac-like membranous structures that are stacked on top of one another to form the grana of plant chloroplast. Chlorophyll and other photosynthetic pigments are situated in the thylakoid membranes, which are the site for the light-dependent reactions of photosynthesis.

Question60

Which one of the following structures is an organelle within an organelle?
Mains 2012

Options:

A. Ribosome

B. Peroxisome

C. ER

D. Mesosome

Answer: A

Solution:

(a) : Ribosomes occur in all living cells except mammalian erythrocytes or red blood corpuscles. Depending upon the place of their occurrence, ribosomes are of two types-cytoplasmic ribosomes and organelle ribosomes. The cytoplasmic ribosomes (cytoribosomes) may remain free in the cytoplasmic matrix or attached to the cytosolic surface of endoplasmic reticulum with the help of special ribophorin or SRP protein. The organelle ribosomes are found in plastids (plastiribosomes) and mitochondria (mitoribosomes) Cytoplasmic ribosome are of 80S type in eukaryotic cell whereas organelle ribosomes are of 70S type.

Question61

Peptide synthesis inside a cell takes place in 2011

Options:

A. chloroplast

B. mitochondria

C. chromoplast

D. ribosomes.

Answer: D

Solution:

Solution:
(d) : Peptide synthesis inside a cell takes place in ribosome. Ribosomes are found in all cells and are involved in protein synthesis. The major constituents of ribosomes are RNA and proteins present in approximately equal amounts.

Question62

Important site for formation of glycoproteins and glycolipids is 2011

Options:

A. vacuole

B. Golgi apparatus

C. plastid

D. lysosome.

Answer: B

Solution:

(b) : Eukaryotic cells contain a unique cluster of membrane vesicles known as Golgi apparatus. It principally performs the function of packaging materials. The newly synthesized proteins are handed over to the Golgi apparatus which is catalysed by the addition of carbohydrates, lipid or sulphates moieties to the proteins. Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

Question63

Which one of the following is not considered as a part of the endomembrane system?
Mains 2011

Options:

A. Golgi complex

B. Peroxisome

C. Vacuole

D. Lysosome

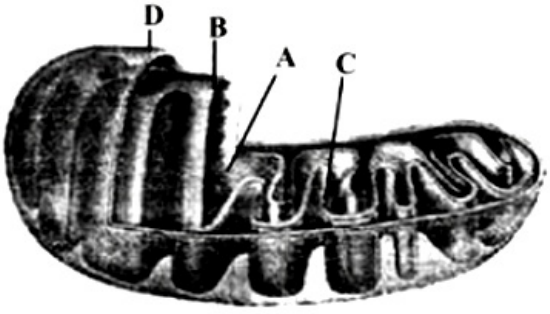
Answer: B

Solution:

Solution:
(b) : While each of the membranous organelles is distinct in terms of its structure and function, many of these are considered together as an endomembrane system because their functions are coordinated. The endomembrane system include endoplasmic reticulum (ER), Golgi complex, lysosomes and vacuoles. since the functions of the mitochondria, chloroplast and peroxisomes are not coordinated with the above components, these are not considered as part of the endomembrane system.

Question64

The figure below shows the structure of a mitochondrion with its four parts labelled A, B, C and D. Select the part correctly matched with its function.



Mains 2011

Options:

A. D (outer membrane) - gives rise to inner membrane by splitting

B. B (inner membrane) - forms infoldings called cristae

C. C (crista) − possesses single circular DNA molecule and ribosomes

D. A (matrix) - major site for respiratory chain enzymes (Mains 2011)

Answer: B

Solution:

Solution:
(b) : Each mitochondrion is a double membrane bound structure with the outer membrane and the inner membrane dividing its lumen distinctly into two aqueous compartments, i.e., the outer compartment and the inner compartment. The inner compartment is called the matrix. The outer membrane forms the continuous limiting boundary of the organelle. The inner membrane forms a number of in foldings called the cristae towards the matrix. The cristae increase the surface area. The two membranes have their own specific enzymes associated with the mitochondrial function.

Question65

The plasma membrane consists mainly of
2010

Options:

A. phospholipids embedded in a protein bilayer

B. proteins embedded in a phospholipid bilayer

C. proteins embedded in a polymer of glucose molecules

D. proteins embedded in a carbohydrate bilayer

Answer: B

Solution:

Solution:
(b) : Plasma membrane consists of lipids (20-79 %), proteins (20-70 %), carbohydrates (1-5 %) and water (20 %) . Lipid molecules possess both hydrophobic and hydrophilic ends and are thus arranged in the form of lipid bilayer. Most common lipid of the bilayer is phospholipid. Protein molecules occur at places both inside (intrinsic proteins) and on the outer side (extrinsic proteins) of the phospholipid bilayer.

Question66

The main area of various types of activities of a cell is
2010

Options:

A. plasma membrane

B. mitochondrion

C. cytoplasm

D. nucleus.

Answer: C

Solution:

Solution:
(c) : Cytoplasm is granular, crystallo-colloidal complex that forms the living protoplasm of a cell excluding its nucleus. It consists of proteins, nucleic acids, fats, carbohydrates, vitamins, minerals, waste metabolites, and all the organelles. It is the main area for various types of activities of a cell like respiration, nutrition, storage, etc.

Question67

Which one of the following has its own DNA?
2010

Options:

A. Mitochondria

B. Dictyosome

C. Lysosome

D. Peroxisome

Answer: A

Solution:

Solution:
(a) : Both mitochondria and chloroplast are semiautonomous organelles. They have their own DNA which produces its own, m RNA, t RNA and r RNA. These organelles also possess their own ribosomes and hence are able to synthesise some of their proteins.

Question68

Which one of the following structures between two adjacent cells is an effective transport pathway?
2010

Options:

A. Plasmodesmata

B. Plastoquinones

C. Endoplasmic reticulum

D. Plasmalemma

Answer: A

Solution:

(a) : Plasmodesmata are fine cytoplasmic strands that connect the protoplasts of adjacent plant cells by passing through their cell walls, Plasmodesmata are cylindrical in shape (about 20-40 nm in diameter) and are lined by the plasma membrane of the two adjacent cells. They permit the passage between cells of substances including ions, sugars, amino acids, and macromolecules.

Question69

An elaborate network of filamentous proteinaceous structures present in the cytoplasm which helps in the maintenance of cell shape is called as
(Mains 2010)

Options:

A. thylakoid

B. endoplasmic reticulum

C. plasmalemma

D. cytoskeleton.

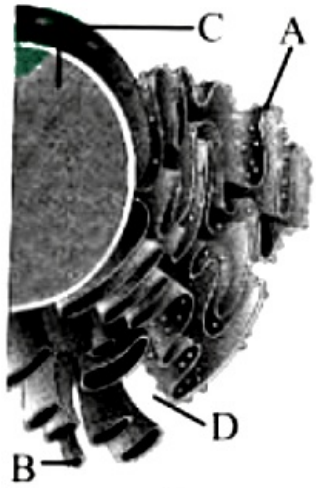
Answer: D

Solution:

Solution:
The **cytoskeleton** is a series of intercellular proteins that help a cell with shape, support, and movement. Cytoskeleton has three main structural components: microfilaments, intermediate filaments, and microtubules.

Question70

Identify the components labelled A, B, C and D in the diagram below from the list (i) to (viii) given along with



Components:

(i) Cristae of mitochondria(ii) Inner membrane of mitochondria(iii) Cytoplasm(iv) Smooth endoplasmic reticulum(v) Rough endoplasmic reticulum(vi) Mitochondrial matrix(vii) Cell vacuole(viii) Nucleus The correct components are:

	A	B	C	D
(a)	(v)	(iv)	(viii)	(iii)
(b)	(i)	(iv)	(viii)	(vi)
(c)	(vi)	(v)	(iv)	(vii)
(d)	(v)	(i)	(iii)	(ii)

2010

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

(a) : A- Rough endoplasmic reticulum
B- Smooth endoplasmic reticulum
C- Nucleus
D-Cytoplasm

Question71

Middle lamella is composed mainly of
2009

Options:

A. muramic acid

B. calcium pectate

C. phosphoglycerides

D. hemicellulose.

Answer: B

Solution:

Solution:
(b): Middle lamella of cell wall is composed of calcium and magnesium pectate. It joins the adjoining cells together and thus acts as a cementing layer.

Question72

Cytoskeleton is made up of
2009

Options:

A. callose deposits

B. cellulosic microfibrils

C. proteinaceous filaments

D. calcium carbonate granules.

Answer: C

Solution:

Solution:
(c) : The ability of eukaryotic cells to adopt a variety of shapes and to carry out coordinated and directed movements depends on the cytoskeleton. The main proteins that are present in the cytoskeleton are tubulin (in the microtubules), actin, myosin, tropomyosin and other (in the microfilaments) and keratins, vimentin, desmin,lamin and other (in intermediate filaments).

Question73

Plasmodesmata are
2009

Options:

A. locomotary structures

B. membranes connecting the nucleus with plasmalemma

C. connections between adjacent cells

D. lignified cemented layers between cells.

Answer: C

Solution:

Solution:
(c) : Plasmodesmata are fine cytoplasmic strands that connect the protoplasts of adjacent plant cells by passing through their cell walls, Plasmodesmata are cylindrical in shape (about 20-40 nm in diameter) and are lined by the plasma membrane of the two adjacent cells. They permit the passage between cells of substances including ions, sugars, amino acids, and macromolecules.

Question74

In germinating seeds fatty acids are degarded exclusively in the
2008

Options:

A. peroxisomes

B. mitochondria

C. proplastids

D. glyoxysomes.

Answer: D

Solution:

Solution:
(d) : Glyoxysomes are small, spherical vesicles enclosed by a single unit membrane. Glyoxysomes are generally found in cells of yeast, Neurospora and in germinating fatty seeds where fat is being converted into carbohydrates, i.e., glyoxylate cycle (gluconeogenesis).

Question75

Vacuole in a plant cell
2008

Options:

A. lacks membrane and contains air

B. lacks membrane and contains water and excretory substances

C. is membrane-bound and contains storage proteins and lipids

D. is membrane-bound and contains water and excretory substances.

Answer: D

Solution:

Solution:
(d): In a plant cell, vacuole may be defined as a non-living reservoir, bounded by a differentially or selectively permeable membrane, the tonoplast. It is filled with a highly concentrated solution called vascular sap or cell sap which contains many dissolved solutes such as organic acids, soluble carbohydrates, soluble nitrogenous compounds as nitrates, enzyme, tannins, chlorides, phosphates, amino acids, alkaloids and anthocyanin pigments.

Question76

The two sub-units of ribosome remain united at a critical ion level of 2008

Options:

A. magnesium

B. calcium

C. copper

D. manganese.

Answer: A

Solution:

Solution:
(a) : Ribosomes are very small organelles having a diameter of $150\,\mathrm{AA} - 250\,\mathrm{AA}$. Each ribosome is made up of two subunits, a smaller subunit and another larger subunit. These two subunits are associated with the help of $\mathrm{M\,g}^{2+}$ ions (at $0.001\mathrm{M}$ concentration). If the $\mathrm{M\,g}^{2+}$ ions concentration is less in cytoplasm, the two units of ribosome separate but when the $\mathrm{M\,g}^{2+}$ ions concentration is increased ten times, the two unites and form a dimer.

Question77

Keeping in view the 'fluid mosaic model' for the structure of cell membrane, which one of the following statement is correct with respect to the movements of lipids and proteins from one lipid monolayer to the other (described as flipflop movement)?
2008

Options:

A. While proteins can flip-flop, lipids can not

B. Neither lipids, nor proteins can flip-flop

C. Both lipids and proteins can flip-flop

D. While lipids can rarely flip-flop, proteins cannot.

Answer: D

Solution:

Solution:
(d) : According to fluid mosaic model there is rapid internal motion involving flexing within each lipid molecule a rapid lateral diffusion of the lipids is possible and a slow 'flip-flop' motion, i.e., a transfer of lipid molecules from one side of the bilayer to the other, is also possible. The lipid molecules might also rotate about their axes. The proteins of the membrane are concerned with the enzymatic activity of the membrane, with transport of molecules, and with a receptor function whereas, the lipid bilayer provides the permeability barrier.

Question78

Which one of the following is not a constituent of cell membrane?
2007

Options:

A. Glycolipids

B. Proline

C. Phospholipids

D. Cholesterol

Answer: B

Solution:

Solution:
(b) : Chemically a biomembrane consists of lipids (20 − 70%), proteins (20 − 70%), carbohydrates (1 − 5%) and water (20%). The important lipids of the membrane are phospholipids (some hundred types), sterols, (e, g. cholesterol), glycolipids, sphingolipid (e, g.) sphingomyelin, cerebrosides). Protein can be fibrous or globular structural carrier, receptor or enzymatic.

Question79

Select the wrong statement from the following.
2007

Options:

A. Both chloroplasts and mitochondria have an internal compartment, the thylakoid space bounded by the thylakoid membrane.

B. Both chloroplasts and mitochondria contain DNA.

C. The chloroplasts are generally much larger than mitochondria.

D. Both chloroplasts and mitochondria contain an inner and an outer membrane.

Answer: A

Solution:

Solution:
(a) : Both mitochondria and chloroplast are semiautonomous organelles. They have their own DNA which produces its own, mRN A, tRN A and rRN A. These organelles also possess their own ribosomes and hence are able to synthesise some of their proteins.

Question80

Biological organisation starts with
2007

Options:

A. cellular level

B. organismic level

C. atomic level

D. submicroscopic molecular level.

Answer: D

Solution:

Solution:
(d) : Molecular assemblies are large organised sets of molecular units that make up parts of organelles. For example, one common macromolecular assembly is the microtubule which is important in forming structure in the cell related to maintaining the cell structure or related to cell movement. The cell (plasma) membrane that surrounds many organelles and the cell is a highly organised molecular assembly.

Question81

Which of the following statements regarding mitochondrial membrane is not correct?

2006

Options:

A. The outer membrane resembles a sieve.

B. The outer membrane is permeable to all kinds of molecules.

C. The enzymes of the electron transfer chain are embedded in the outer membrane.

D. The inner membrane is highly convoluted forming a series of infoldings.

Answer: C

Solution:

Solution:
(c) : The outer membrane of mitochondrion is smooth, freely permeable to most small molecules, contains fewer enzymes and is poor in proteins. It has porin proteins which form channels for the passage of molecules through it. It allows uptake of substrates and release of ATP. The inner membrane is semipermeable and regulates the passage of materials into and out of the mitochondrion. It is rich in enzymes and carrier proteins (permeases). It is usually produced into numerous in folds called cristae (singular crista). It bears minute regularly spaced lollipop-shaped particles known as oxysomes. The rest of the inner membrane contains the electron carrier molecules ofthe electron transport chain.

Question82

Which of the following statements regarding cilia is not correct?
2006

Options:

A. Cilia contain an outer ring of nine doublet microtubules surrounding two singlet microtubules.

B. The organized beating of cilia is controlled by fluxes of mathrm Ca^{2+} across the membrane.

C. Cilia are hair-like cellular appendages.

D. Microtubules of cilia are composed of tubulin.

Answer: B

Solution:

Solution:
(b) : Cilia are fine hair like vibratile, cytoplasmic processes borne by certain cell types. Their movement either propel the organism or move the medium past a fixed cell. The cilia are enclosed by a unit membrane which is an extension of the plasma membrane of the cell. Within the membrane, is a fluid matrix having a supporting axial shaft, or axoneme. The microtubules, single as well as double, are composed of the globular units of the protein tubulin. The arms of A microtubules contain a protein dynein. The latter is ATPase enzyme which catalyzes hydrolysis of ATP to ADP, and transfers the free energy released direct to ciliary work.

Question83

A major breakthrough in the studies of cells came with the development of electron microscope This is because
2006

Options:

A. the electron microscope is more powerful than the light microscope as it uses a beam of electrons which has wavelength much longer than that of photons

B. the resolving power of the electron microscope is much higher than that of the light microscope

C. the resolving power of the electron microscope is $200 - 350$nm as compared to $0.1 - 0.2$nm for the light microscope

D. electron beam can pass through thick materials, whereas light microscopy requires thin sections.

Answer: B

Solution:

Solution:
(b) : Microscopes are used for studying cellular structures. They are used to magnify small objects. In electron microscopes, a high energy beam of electrons is focused through electromagnetic lenses. It can magnify very small details with high resolving power. The increased resolution results from the shorter wavelength of the electron beam.

Question84

Chlorophyll in chloroplasts is located in
2005

Options:

A. grana

B. pyrenoid

C. stroma

D. both grana and stroma.

Answer: A

Solution:

(a) : Thylakoid are the flattened sac-like membranous structures that are stacked on top of one another to form the grana of plant chloroplast. Chlorophyll and other photosynthetic pigments are situated in the thylakoid membranes, which are the site for the light-dependent reactions of photosynthesis.

Question85

A student wishes to study the cell structure under a light microscope having 10 mathrm X eyepiece and 45 mathrm X objective. He should illuminate the object by which one of the following colours of light so as to get the best possible resolution?
2005

Options:

A. Blue

B. Green

C. Yellow

D. Red

Answer: A

Solution:

Solution:
(a) : Resolution of microscope is inversely proportional to wavelength of light used. Out of four options given, blue light has minimum wavelength and hence maximum resolution.

Question86

According to widely accepted "fluid mosaic model" cell membranes are semi-fluid, where lipids and integral proteins can diffuse randomly. In recent years, this model has been modified in several respects. In this regard, which of the following statements is incorrect?
2005

Options:

A. Próteins in cell membranes can travel within the lipid bilayer.

B. Proteins can also undergo flip-flop movements in the lipid bilayer.

C. Proteins can remain confined within certain domains of the membrane.

D. Many proteins remain completely embedded within the lipid bilayer.

Answer: B

Solution:

(b) : According to fluid mosaic model there is rapid internal motion involving flexing within each lipid molecule a rapid lateral diffusion of the lipids is possible and a slow 'flip-flop' motion, i.e., a transfer of lipid molecules from one side of the bilayer to the other, is also possible. The lipid molecules might also rotate about their axes. The proteins of the membrane are concerned with the enzymatic activity of the membrane, with transport of molecules, and with a receptor function whereas, the lipid bilayer provides the permeability barrier.

Question87

Centromere is required for
2005

Options:

A. movement of chromosomes towards poles

B. cytoplasmic cleavage

C. crossing over

D. transcription.

Answer: A

Solution:

(a) : Centromere is the point at which the two chromatids of a chromosome are held together. During movement of chromosomes, the spindle fibres (on which the chromatids move) are attached to the centromere. Crossing over involves physical exchange of genetic material between non-sister chromatids of homologous chromosomes. Cytoplasmic cleavage is the division of cytoplasm. Transcription is the process in which the genetic information of DNA is transferred to m RNA as the first step in protein synthesis.

Question88

Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on
2005

Options:

A. membrane potential

B. accumulation of Na ions

C. accumulation of K ions

D. proton gradient.

Answer: D

Solution:

(d) : Chemiosmotic coupling hypothesis is the most widely accepted explanation for oxidative phosphorylation in mitochondria and photophosphorylation in thylakoid membranes. Mitchell proposed the idea of chemiosmotic coupling. He suggested that a concentration gradient of protons is established across the mitochondrial membrane because there is an accumulation of hydrogen ions on one side of the mitochondrial membrane. The proton accumulation is necessary for energy transfer to the endergonic ADP phosphorylation process.

Question89

The main organelle involved in modification and outing of newly synthesized proteins to their destinations is
2005

Options:

A. chloroplast

B. mitochondria

C. lysosome

D. endoplasmic reticulum.

Answer: D

Solution:

Solution:
(d) : The proteins formed on ribosomes pass into the ER lumen where they are modified. Then the modified proteins move on into the transitional area, where the ER buds off membranous sacs, the transport vesicles, carrying the proteins to the Golgi apparatus.

Question90

The telomeres of eukaryotic chromosomes consist of short sequences of
2004

Options:

A. thymine rich repeats

B. cytosine rich repeats

C. adenine rich repeats

D. guanine rich repeats.

Answer: D

Solution:

(d) : Telomeres are non sticky terminal ends of the chromosomes. It has heterochromatin and repetitive DNA.

Question91

In chloroplasts, chlorophyll is present in the
2004

Options:

A. outer membrane

B. inner membrane

C. thylakoids

D. stroma.

Answer: C

Solution:

(c) : Thylakoid are the flattened sac-like membranous structures that are stacked on top of one another to form the grana of plant chloroplast. Chlorophyll and other photosynthetic pigments are situated in the thylakoid membranes, which are the site for the light-dependent reactions of photosynthesis.

Question92

Cellular totipotency is demonstrated by
2003

Options:

A. only gymnosperm cells

B. all plant cells

C. all eukaryotic cells

D. only bacterial cells.

Answer: B

Solution:

(b) : Totipotency is the ability of a living somatic plant cell to develop into a complete plant. It was first demonstrated by Steward et. al (1964) using phloem cells of carrot. This technique is now used for multiplying rare and endangered plants through micro-propagations. This technique is widely used for multiplying plants e.g., Chrysanthemum, Dioscorea floribunda, Coleus, Crotons, carnation plants etc.

Question93

Ribosomes are produced in
2002

Options:

A. nucleolus

B. cytoplasm

C. mitochondria

D. golgi body.

Answer: A

Solution:

Solution:
(a) : Nucleolus synthesizes and stores RNA. The ribosomal proteins are synthesized in the cytoplasm and shift to the nucleolus for the formation of ribosomal subunits by complexing with rRNA.

Question94

In fluid mosaic model of plasma membrane
2002

Options:

A. upper layer is non-polar and hydrophilic

B. upper layer is polar and hydrophobic

C. phospholipids form a bimolecular layer in middle part

D. proteins form a middle layer.

Answer: C

Question95

Element necessary for the middle lamella is
2001

Options:

A. Ca

B. Z n

C. K

D. Cu.

Answer: A

Solution:

Solution:
(a) : Middle lamella is the first formed layer, present between the two adjacent cells. It is situated outside the primary cell wall. It is made up of calcium and magnesium pectate.

Question96

Microtubules are absent in
2001

Options:

A. mitochondria

B. flagella

C. spindle fibres

D. centrioles.

Answer: A

Question97

Proteinaceous pigment which controls the activities concerned with light is
2001

Options:

A. phytochrome

B. chlorophyll

C. anthocyanin

D. carotenoids.

Answer: A

Solution:

(a) : Phytochrome is a plant pigment that can detect the presence or absence of light and is involved in regulating many processes that are linked to day length (photoperiod), such as seed germination and initiation of flowering. It consists of a light-detecting portion, called a chromophore, linked to a small protein and exists in two interconvertible forms with different physical properties, particularly in the ability to bind to membranes.

Question98

Lysosome contains
2000

Options:

A. oxidative enzymes

B. hydrolytic enzymes

C. reductive enzymes

D. anabolic enzymes.

Answer: B

Solution:

Solution:
(b) : A lysosome is a tiny sac bounded by a single unit membrane of lipoprotein. It contains a dense, finely granular fluid. The latter consists of glycoprotein hydrolytic (digestive) enzymes called acid hydrolases. These include proteases, lipases, nucleases, glycosidases, sulphatases, acid phosphatases, etc.

Question99

Which of the following ribosomes are engaged in protein synthesis in animal cell?
2000

Options:

A. Ribosomes which occur on nuclear membrane and ER

B. Ribosomes of only cytosol

C. Ribosomes of only nucleolus and cytosol

D. Ribosomes of only mitochondria and cytosol

Answer: A

Solution:

(a) : Ribosomes present in nuclear membrane and endoplasmic reticulum take part in protein synthesis. Two or more ribosomes simultaneously engaged in protein synthesis on the same mRNA strand forming polyribosomes. The ribosome functions as a template, bringing together different components required for protein synthesis.

Question100

Function of telomeres in nucleus is
2000

Options:

A. poleward movement

B. to initiate the RNA synthesis

C. to seal the ends of chromosome

D. to recognise the homologous chromosome.

Answer: C

Question101

Which cell organelle is concerned with glycosylation of protein?
2000

Options:

A. Ribosome

B. Peroxisome

C. Endoplasmic reticulum

D. Mitochondria

Answer: C

Solution:

Solution:
Rough endoplasmic reticulum bears enzymes in the region of pores for modifying polypeptides synthesised by attached ribosomes, e.g., glycosylation.

Question102

Which of the following organelles has single membrane?
1999

Options:

A. Mitochondria

B. Spherosomes

C. Nucleus

D. Cell wall

Answer: B

Solution:

Solution:
(b) : The spherosomes are, spherical bodies, about 0.5-1pm wide and enclosed by a single unit membrane. They contain granular contents rich in lipids but also have some proteins. They occur in most plant cells but are abundant in the endosperm cells of oil seeds. Spherosomes, arise from the endoplasmic reticulum.

Question103

The proteins are synthesized at
1999

Options:

A. centrosomes

B. Golgi bodies

C. ribosomes

D. mitochondria.

Answer: C

Solution:

Solution:
(c) : The ribosomes provide space for the synthesis of proteins in the cell. Hence, they are known as the "protein factories" of the cell. The ribosomes bound to the membranes generally synthesize proteins for export as secretions by exocytosis, or for incorporation into membranes, or for inclusion into lysosomes. The free ribosomes generally produce enzymic proteins for use in the cell itself.

Question104

Which of the following structures will not be common to mitotic eell of a higher plant?
1997

Options:

A. Centriole

B. Spindle fibre

C. Cell plate

D. Centromere

Answer: A

Solution:

(a) : The centrioles occur in nearly all animal cells and in motile plant cells, such as zoospores of algae, sperm cells of ferns, and motile algae. They are absent is amoebae, prokaryotic cells, higher gymnosperms and all angiosperms. An interphase (undividing) cell has a pair of centrioles (diplosome) usually near the nucleus. They lie in a small mass of specialized, distinctly staining cytoplasm that lacks other cell organelles. The centrioles and the centrosphere are together referred to as centrosome. Before cell division, the centrioles duplicate so that a dividing cell has a pair of centrioles at each pole of the spindle. Spindle fibre, cell plate and centromere are present in all plant cells.

Question105

The mechanism of ATP formation both in chloroplast and mitochondria is explained by
1997

Options:

A. chemiosmotic theory

B. Munch's hypothesis (mass flow model)

C. relay pump theory of Godlewski

D. Cholodny-Wont's model.

Answer: A

Solution:

Solution:
(a) : Chemiosmotic coupling hypothesis is the most widely accepted explanation for oxidative phosphorylation in mitochondria and photophosphorylation in thylakoid membranes. Mitchell proposed the idea of chemiosmotic coupling. He suggested that a concentration gradient of protons is established across the mitochondrial membrane because there is an accumulation of hydrogen ions on one side of the mitochondrial membrane. The proton accumulation is necessary for energy transfer to the endergonic ADP phosphorylation process.

Question106

Protein synthesis in an animal cell, takes place
1997

Options:

A. in the cytoplasm as well as endoplasmic reticulum

B. only on ribose attached to nucleon

C. only in the cytoplasm

D. in the nucleolus as well as in the cytoplasm.

Answer: D

Solution:

Solution:
(d) : Protein synthesis in an animal cell, takes place in the nucleolus as well as in the cytoplasm. Main part of protein synthesis (transcription and translation) occurs in nucleolus. Chain elongation occurs in cytoplasm.

Question107

Lysosomes are rich in
1996

Options:

A. nucleic acids

B. hydrolytic enzymes

C. carbohydrates

D. hormones

Answer: B

Solution:

(b) : A lysosome is a tiny sac bounded by a single unit membrane of lipoprotein. It contains a dense, finely granular fluid. The latter consists of glycoprotein hydrolytic (digestive) enzymes called acid hydrolases. These include proteases, lipases, nucleases, glycosidases, sulphatases, acid phosphatases, etc.

Question108

Colchicine is an inhibitory chemical, which
1996

Options:

A. stops the functioning of centriole

B. prevents attaching of centromeres with rays

C. prevents the spindle formation in mitosis

D. prevents the formation of equatorial plane.

Answer: C

Solution:

Solution:
(c) : Colchicine is an alkaloid derived from the autumn crocus, Colchicum autumnale. It inhibits spindle formation in cells during mitosis so that chromosomes cannot separate during anaphase, thus inducing multiple sets of chromosomes. Colchicine is used in genetics, cytology, and plant breeding research and also in cancer therapy to inhibit cell division.

Question109

The prokaryotic flagella possess
1995

Options:

A. helically arranged protein molecule

B. "9 + 2" membrane enclosed structure

C. unit membrane enclosed fibre

D. protein membrane enclosed fibre

Answer: A

Solution:

(a) : Prokaryotic flagellum is not surrounded by any membrane. It consists of a single thread. The thread is made of numerous identical spherical protein sub-units called, flagellin. Each subunit is about 40 A in diameter. The flagellin sub-units are arranged in helical spirals and form a hollow cylinder. Each flagellum is about 120-150 Å thick.

Question110

The desmosomes are concerned with
1995

Options:

A. cell division

B. cell adherence

C. cytolysis

D. cellular excretion

Answer: B

Solution:

Solution:
(b) : In desmosomes circular patches of cell membranes are held together by interaction of proteins that extend through each membrane into the space between cells. The cell membrane has on the inner side a dense plate of protein for mechanical support and bears fine filaments, the tonofibrils, radiating into the cell. The desmosomes act as "spot welds" and keep the cells firmly together.

Question111

Which of the following organelles contain enzymes that have digestive action?
1994

Options:

A. Ribosomes

B. Polysomes

C. Plastids

D. Lysosomes

Answer: D

Solution:

Solution:
(d) : A lysosome is a tiny sac bounded by a single unit membrane of lipoprotein. It contains a dense, finely granular fluid. The latter consists of glycoprotein hydrolytic (digestive) enzymes called acid hydrolases. These include proteases, lipases, nucleases, glycosidases, sulphatases, acid phosphatases, etc.

Question112

In mitochondria, cristae act as sites for
1994

Options:

A. protein synthesis

B. phosphorylation of flavoproteins

C. breakdown of macromolecules

D. oxidation-reduction reaction.

Answer: D

Solution:

Solution:
(d) : Respiratory chain is located in the inner membrane (cristae) of mitochondria. It consists of a series of proteins containing oxidation-reduction groups. Chemical treatment of the mitochondrial membrane results in the isolation of five complexes which have been designated as complexes I, II, IH, IV and V

Question113

Centromere is required for
1994

Options:

A. replication of DNA

B. chromosome segregation

C. poleward movement of chromosomes

D. cytoplasmic cleavage.

Answer: C

Solution:

(c) : Centromere is the point at which the two chromatids of a chromosome are held together. During movement of chromosomes, the spindle fibres (on which the chromatids move) are attached to the centromere. Crossing over involves physical exchange of genetic material between non-sister chromatids of homologous chromosomes. Cytoplasmic cleavage is the division of cytoplasm. Transcription is the process in which the genetic information of DNA is transferred to m RNA as the first step in protein synthesis.

Question114

Which one of the following organelles is located near the nucleus and contains a collection of flattened membrane bound cisternae?
1994

Options:

A. Nucleolus

B. Mitochondrion

C. Centriole

D. Golgi apparatus

Answer: D

Solution:

Solution:
(d) : Golgi apparatus is a stack of parallel, flattened, intercommunicating sacs or cisternae and many peripheral tubules and vesicles. The cisternae vary in number from 3 to 7 in most animal cells and from 10 to 20 in plant cells. They are usually equally spaced in the pile, separated from each other by thin layers of intercisternal cytoplasm. The latter may contain a layer of parallel fibres, called intercisternal elements, that support the cisternae. The cisternae are free of ribosomes and have swollen ends. They look like the smooth endoplasmic reticulum.

Question115

The inner membrane of the mitochondria is, usually, highly convoluted forming a series of infoldings known as
1994

Options:

A. thylakoids

B. lamellae

C. cristae

D. grana

Answer: C

Solution:

Solution:
(c) : The outer membrane of mitochondrion is smooth, freely permeable to most small molecules, contains fewer enzymes and is poor in proteins. It has porin proteins which form channels for the passage of molecules through it. It allows uptake of substrates and release of ATP. The inner membrane is semipermeable and regulates the passage of materials into and out of the mitochondrion. It is rich in enzymes and carrier proteins (permeases). It is usually produced into numerous infolds called cristae (singular crista). It bears minute regularly spaced lollipop-shaped particles known as oxysomes. The rest of the inner membrane contains the electron carrier molecules of the electron transport chain.

Question116

Besides giving out secretory vesicles, the Golgi apparatus is also concermed with the formation of
1994

Options:

A. lysosomes

B. plastids

C. grana of chloroplasts

D. cell plates after cell division in plant

Answer: A

Solution:

Solution:
(a) : The two poles of a Golgi apparatus are called cis face and trans face, which act respectively as the receiving and shipping departments. The vesicles lie near the ends and concave surface of the Golgi complex. They are pinched off from the tubules of the cisternae. They are of two types : smooth or secretory vesicles, which have a smooth surface and contain secretions of the cell; and coated vesicles, that have rough surface and elaborate membrane proteins. They carry materials to or from the cisternae. The Golgi complex gives rise to primary lysosomes by budding from the trans face of cisternae.

Question117

Active and passive transports across cell membrane differ in
1993

Options:

A. passive transport is nonselective

B. passive transport is along the concentration gradient while active transport is due to metabolic energy

C. active transport is more rapid

D. passive transport is confined to anions while active transport in confined to cations

Answer: B

Solution:

Solution:
(b) : Active and passive transports across cell membrane differ in passive transport is due to metabolic energy. There is always expenditure of energy in active transport.

Question118

Balbiani rings (puffs) are sites of
1993

Options:

A. DNA replication

B. RNA and protein synthesis

C. synthesis of polysaccharides

D. synthesis of lipids

Answer: B

Solution:

Solution:
(b) : Balbiani rings (puffs) are site of RNA and protein synthesis. These chromosomes show distinct dark and light bands. Euchromatin is present in dark bands and heterochromatin is present in light bands. These bands helps in mapping of chromosomes in cytogenetic studies. These chromosomes form puffs or loops (in region of dark bands) which are called Balbiani puffs or Balbiani rings where synthesis of m RNA occurs.

Question119

In plant cells, peroxisomes are associated with
1993

Options:

A. photorespiration

B. phototropism

C. photoperiodism

D. photosynthesis

Answer: A

Solution:

Solution:
(a) : In plant cells, peroxisomes are associated with photorespiration. Peroxisomes are found only in C_3 plants where a wasteful phenomenon of photorespiration occurs. The other organelles associated with this process are chloroplast and mitochondria. Peroxisomes are also reported in animal cells, i.e., liver and kidney cells. The peroxisome contains several enzyme such as amino transferse, glycolate oxidase, glyoxylate reductase, peroxidase and catalase etc.

Question120

Membranous bag with hydrolytic enzymes which is used for controlling intracellular digestion of macromolecules is
1993

Options:

A. endoplasmic reticulum

B. nucleosome

C. lysosome

D. phagosome

Answer: C

Solution:

Solution:
(c) : A lysosome is a tiny sac bounded by a single unit membrane of lipoprotein. It contains a dense, finely granular fluid. The latter consists of glycoprotein hydrolytic (digestive) enzymes called acid hydrolases. These include proteases, lipases, nucleases, glycosidases, sulphatases, acid phosphatases, etc.

Question121

Golgi apparatus is absent in
1993

Options:

A. higher plants

B. yeast

C. bacteria and blue-green algae

D. none

Answer: C

Solution:

(c) : Golgi apparatus is absent in bacteria and blue green algae. Golgi bodies are absent in prokaryotic cells and present in eukaryotic cells except in male gametes of bryophytes and pteridophytes, mammalian RBCs, sieve tubes of plants and in cells of fungi.

Question122

Cell recognition and adhesion occur due to biochemicals of cell membranes named
1993

Options:

A. proteins

B. lipids

C. proteins and lipids

D. glycoproteins and glycolipids

Answer: D

Solution:

Solution:
(d) : Cell recognition and adhesion occur due to biochemicals of cell membranes named glycoproteins and glycolipids. These are formed due to small carbohydrate molecules present on lipids and extrinsic proteins.

Question123

In salivary gland chromosomes/polytene chromosomes, pairing is
1993

Options:

A. absent

B. occasional

C. formed between nonhomologous chromosomes

D. formed between homologous chromosomes

Answer: D

Solution:

Solution:
(d) : In salivary gland chromosomes/polytene chromosomes, pairing is formed between homologous chromosomes. A characteristics feature of these chromosomes is that somatic pairing occurs in them and hence their number appears half of normal somatic cells.

Question124

Which is correct about cell theory in view of current status of our knowledge about cell structure?
1993

Options:

A. It needs modification due to discovery of subcellular structures like chloroplasts and mitochondria.

B. Modified cell theory means that all living being are composed of cells capable of reproducing.

C. Cell theory does not hold good because all living beings (e.g., viruses) do not have cellular organisation.

D. Cell theory means that all living objects consists of cells whether or not capable of reproducing

Answer: C

Solution:

Solution:
(c) : Viruses are an exceptions to the cell theory as they are obligate parasites (subcellular in nature). Paramecium, Rhizopus, Vaucheria are some examples which may or may not be exceptions to the theory.

Question125

Names of Schleiden and Schwann are associated with
1993

Options:

A. protoplasm as the physical basis of life

B. cell theory

C. theory of cell lineage

D. nucleus functions as control centre of cell

Answer: B

Solution:

Solution:
(b) : Names of Schleiden and Schwann are associated with cell theory in 1839 . The concept that "All living organisms are composed of cell" is known as cell theory.

Question126

Binding of specific protein on regulatory DNA sequency can be studied by means of
1993

Options:

A. ultra centrifugation

B. electron microscope

C. light microscope

D. X-rays crystallography

Answer: D

Solution:

Solution:
(d) : X-rays crystallography is a technique which is used to study of binding protein on regulatory DNA sequence. In this technique, X-rays pass through a crystal of a substance and form a diffraction pattern. With the help of this technique, the arrangement of atoms in the molecular structure of enzymes, proteins, DNA, etc. can be studied. Wilkins, Watson and Crick used this technique to determine the molecular configuration of double helix of DNA.

Question127

All types of plastids possess essentially the same structure because they
1992

Options:

A. perform the same function

B. store food materials like starch, fat and protein

C. occur in aerial parts

D. can transform from one form to another

Answer: D

Solution:

(d) : All the plastids have a common origin and one type of plastid can change into another. Plastids are of 2 main types lencoplasts and chromoplasts. The leucoplasts are colourless and occur in the cells not exposed to sunlight. The chromoplasts are coloured occur in the cells exposed to sunlight.

Question128

Experiments on Acetabularia by Hammerling proved the role of
1992

Options:

A. cytoplasm in controlling differentiation

B. nucleus in heredity

C. chromosomes in heredity

D. nucleo-cytoplasmic ratio

Answer: B

Solution:

Solution:
(b) : Acetabularia used in Hammerling's nucleocytoplasmic experiment is unicellular uninucleate green algae. Hammerling's experiment on Acetabularia involved exchanging rhizoid and stalk. Presence of hereditary information in the nucleous was proved by the work of Hammerling on single celled alga Acetabularia.

Question129

Which one is apparato reticolare?
1992

Options:

A. Golgi apparatus

B. Endoplasmic reticulum

C. Microfilaments

D. Microtubules

Answer: A

Solution:

Solution:
(a) : Apparato reticolare are Golgi apparatus. The Golgi apparatus was named after Camillo Golgi (1906) who discovered this cell structure in nerve cells (1898) and assigned it the role of a cell organelle. Inspired by its appearance, Golgi named this cell structure the inner reticular apparatus (apparato reticoldre interno):

Question130

An outer covering membrane is absent over
1992

Options:

A. nucleolus

B. lysosome

C. mitochondrion

D. plastid

Answer: A

Solution:

Solution:
(a) : An outer covering membrane is absent over nucleolus. Nucleolus is a dense, spherical, colloidal body which remains attached with nucleolar organizing chromosomes. It was discovered by Fontana (1781) and termed as nucleolus by Bowman (1840). The main function of nucleolus is the synthesis of ribosomal RNA and it is called store house of RNA. It plays important role in cell division also.

Question131

All plastids have similar structure because they can
1992

Options:

A. store starch, lipids and proteins

B. get transformed from one type to another

C. perform same function

D. be present together

Answer: B

Solution:

(b) : All the plastids have a common origin and one type of plastid can change into another. Plastids are of 2 main types lencoplasts and chromoplasts. The leucoplasts are colourless and occur in the cells not exposed to sunlight. The chromoplasts are coloured occur in the cells exposed to sunlight.

Question132

Oxysomes or $F_0 - F_1$ particles occur on
1992

Options:

A. thylakoids

B. mitochondrial surface

C. inner mitochondrial membrane

D. chloroplast surface

Answer: C

Solution:

Solution:
(c) : Oxysomes or $F_0 - F_1$ particles occurs on inner mitochondrial membrane. Each particle is made up of base, stalk and head and is about 10 mm in length. The number of oxysomes per mitochondrion varies from $10^4 - 10^5$. Chemically these are made up of phospholipid core and protein cortex. Oxysomes have ATP as enzyme molecules and therefore, responsible for ATP synthesis. These elementary particles are also called $F_0 - F_1$ particles by some workers. The base of these is called F_0 subunit and head is called F_1 subunit.

Question133

Ribosomes are the centre for
1992

Options:

A. respiration

B. photosynthesis

C. protein synthesis

D. fat synthesis

Answer: C

Solution:

(c) : Peptide synthesis inside a cell takes place in ribosome. Ribosomes are found in all cells and are involved in protein synthesis. The major constituents of ribosomes are RNA and proteins present in approximately equal amounts.

Question134

Angstrom (Å) is equal to
1992

Options:

A. 0.01mm

B. 0.001mm

C. 0.0001mm

D. 0.00001mm

Answer: C

Solution:

Solution:
(c) : An angstrom (symbol Å) is a non-SI unit of length that is internationally recognised, equal to 0.1 nanometer (nm) . It can be written in scientific notations as 1×10^{-10}m. It is used in expressing the size of atoms, length of chemical bonds etc. It is named after Anders Jonas Angstrom.

$$\text{Angstrom} = 0.0001\text{mm}$$

Question135

Electron microscope has a high resolution power. This is due to
1992,1990

Options:

A. electromagnetic lenses

B. very low wavelength of electron beam

C. low wavelength of light source used

D. high numerical aperture of glass lenses used

Answer: B

Solution:

(b) : Microscopes are used for studying cellular structures. They are used to magnify small objects. In electron microscopes, a high energy beam of electrons is focused through electromagnetic lenses. It can magnify very small details with high resolving power. The increased resolution results from the shorter wavelength of the electron beam.

Question136

Addition of new cell wall particles amongst the existing ones is
1991

Options:

A. deposition

B. apposition

C. intussusception

D. aggregation

Answer: C

Solution:

Solution:
(c) : Addition of new cell wall particles amongst the existing one is intussusception. Growth of cell wall occurs by two methods - by intussusception and by apposition. By intussusception, the primary wall is stretched and materials of secondary wall are deposited. By apposition, material of secondary wall are deposited in the form of thin layers.

Question137

Cell wall shows
1991

Options:

A. complete permeability

B. semipermeability

C. differential permeability

D. impermeability

Answer: A

Solution:

(a) : Cell wall shows complete permeability because it helps in the transport of substances into and out of the cell. The main function of cell wall is to provide mechanical support.

Question138

Ribosomes were discovered by 1991

Options:

A. Golgi

B. Porter

C. de Robertis

D. Palade

Answer: D

Solution:

Solution:
(d) : Ribosomes are minute cellular, nonmembranous particles having an average diameter of 23 mm (230 A°) In plant cells ribosomes were first of all observed by Robinson and Brown (1953) in bean roots. In animal cells, these were discovered by Palade (1955), hence are called Palade particles. Ribosomes form a part of fraction microsome, a term given by A. Claude (made of broken ER, ribosomes and Golgi bodies).

Question139

Fluid mosaic model of cell membrane was put forward by 1991

Options:

A. Danielli and Davson

B. singer and Nicolson

C. Garner and Allard

D. Watson and Crick

Answer: B

Solution:

(b) : According to the fluid mosaic model of cell membrane structure proposed by singer and Nicolson (1972) plasma membrane contains about $50-60\%$ proteins and $50-40\%$ lipids. Lipids form a bilayer with hydrophilic heads pointing outwards. Cell membrane allows transport of some molecules by passive transport eg., water, neutral solutes while some are transported actively e . g., Na^{+} / K^{+} pump.

Question140

Resolution power is the ability to
1991

Options:

A. distinguish two close points

B. distinguish two close objects

C. distinguish amongst organelles

D. magnify image

Answer: B

Solution:

Solution:
(b) : Resolution power is the ability to distinguish two close objects. It is the ability of a system to distinguish two close points as two separate points. Resolving power of microscope depends upon the numerical aperature of the objective lens system and its wavelength.

Question141

Hammerling's experiments of Acetabularia involved exchanging
1990

Options:

A. cytoplasm

B. nucleus

C. rhizoid and stalk

D. gametes

Answer: C

Solution:

Solution:
(c) : Acetabularia used in Hammerling's nucleocytoplasmic experiment is unicellular uninucleate green algae. Hammerling's experiment on Acetabularia involved exchanging rhizoid and stalk. Presence of hereditary information in the nucleous was proved by the work of Hammerling on single celled alga Acetabularia.

Question142

The latest model for plasma membrane is
1990

Options:

A. lamellar model

B. unit membrane model

C. fluid mosaic model

D. molecular lipid model

Answer: C

Solution:

Solution:
(c) : According to the fluid mosaic model of cell membrane structure proposed by singer and Nicolson (1972) plasma membrane contains about $50-60\%$ proteins and $50-40\%$ lipids. Lipids form a bilayer with hydrophilic heads pointing outwards. Cell membrane allows transport of some molecules by passive transport eg., water, neutral solutes while some are transported actively $e.g.$, Na^{+} / K^{+} pump.

Question143

Magnification of compound microscope is not connected with
1990

Options:

A. numerical aperture

B. focal length of objective

C. focal length of eye piece

D. tube length

Answer: A

Solution:

Solution:
(a) : Magnification of compound microscope is not connected with numerical aperature. The magnifying power is represented by the symbol 'X'. The total magnification of a microscope is obtained by multiplying the objective magnification and ocular lens magnification $e.g.$, if the magnifying power of an ocular lens is $10X$ and of the objective is $40X$, then the total magnifying power of a microscope is $10 \times 40 = 400X$.

Question144

A bivalent consists of
1989

Options:

A. two chromatids and one centromere

B. two chromatids and two centromeres

C. four chromatids and two centromeres

D. four chromatids and four centromeres

Answer: C

Solution:

Solution:
(c) : A bivalent consist of four chromatids and two centromeres. Bivalent is a pair of homologous chromosome lying together in the zygotene stage of prophase I of first meiotic division.

Question145

Nucleoproteins are synthesised in
1989

Options:

A. nucleoplasm

B. nuclear envelope

C. nucleolus

D. cytoplasm

Answer: D

Solution:

Solution:
(d) : Nucleoproteins are compounds present in cells of living organisms that consist of nucleic acids with proteins. Nucleoproteins are synthesized in cytoplasm. These are conjugated proteins. They are of two types - Deoxyribonucleoproteins and ribonucleoproteins.

Question146

Polyribosomes are aggregates of
1989

Options:

A. ribosomes and r RNA

B. only r RNA

C. peroxisomes

D. several ribosomes held together by string of m RNA

Answer: D

Solution:

Solution:
(d) : Polyribosomes are aggregates of several ribosomes held together by string of mRNA. Polyribosomes consists of $4-8$ ribosomes which are attached to a single strand of messenger RNA or mRNA. This mechanism help in synthesis of several copies of the same protein.

Question147

Plasma membrane is made of
1989

Options:

A. proteins and carbohydrates

B. proteins and lipids

C. proteins, lipids and carbohydrates

D. proteins, some nucleic acid and lipids

Answer: C

Solution:

Solution:
(c) : Plasma membrane consists of lipids $(20-79\%)$, proteins $(20-70\%)$, carbohydrates $(1-5\%)$ and water (20%). Lipid molecules possess both hydrophobic and hydrophilic ends and are thus arranged in the form of lipid bilayer. Most common lipid of the bilayer is phospholipid. Protein molecules occur at places both inside (intrinsic proteins) and on the outer side (extrinsic proteins) of the phospholipid bilayer.

Question148

Organelles can be separated from cell homogenate through

1989

Options:

A. chromatography

B. X-rays diffraction

C. differential centrifugation

D. auto-radiography

Answer: C

Solution:

Solution:
(c) : Organelles can be separated from cell homogenate through differential centrifugation. The basic principle involved here is sedimentation of particles in a suspension by centrifugal force. In a centrifuge, the particles sediment at different rates when an accelerating force is subjected. The rate of sedimentation depends upon the size of the particles, its shape and density.

Question149

Acetabularia used in Hammerling's nucleocytoplasmic experiments is 1988

Options:

A. unicellular fungus

B. multicellular fungus

C. unicellular uninueleate green algae

D. unicellular multinucleate green algae

Answer: C

Solution:

Solution:
(c) : Acetabularia used in Hammerling's nucleocytoplasmic experiment is unicellular uninucleate green algae. Hammerling's experiment on Acetabularia involved exchanging rhizoid and stalk. Presence of hereditary information in the nucleous was proved by the work of Hammerling on single celled alga Acetabularia.

Question150

According to fluid mosaic model, plasma membrane is composed of 1988

Options:

A. phospholipids and oligosaccharides

B. phospholipids and hemicellulose

C. phospholipids and integral proteins

D. phospholipids, extrinsic proteins and intrinsic proteins

Answer: D

Solution:

(d) : Plasma membrane consists of lipids ($20-79\%$), proteins ($20-70\%$), carbohydrates ($1-5\%$) and water (20%). Lipid molecules possess both hydrophobic and hydrophilic ends and are thus arranged in the form of lipid bilayer. Most common lipid of the bilayer is phospholipid. Protein molecules occur at places both inside (intrinsic proteins) and on the outer side (extrinsic proteins) of the phospholipid bilayer.
