

Aga Khan University

Resource: Biology Practice Questions

MBBS Programme

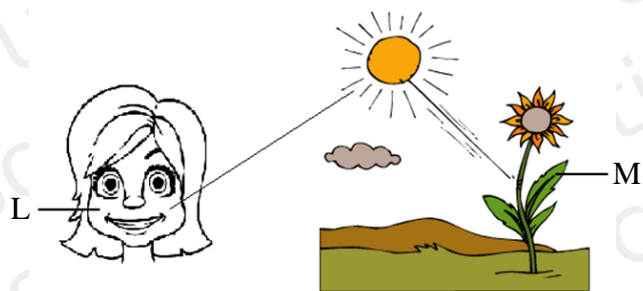
Note:

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1. Which of the following processes occurs in the cytosol of the cell?

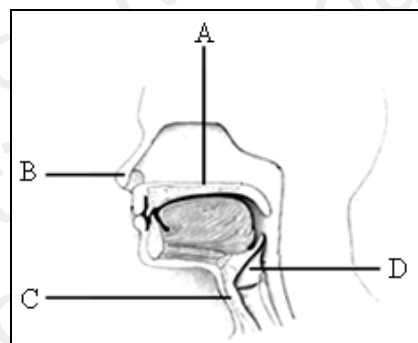
- A. Kreb's Cycle
- B. Electron Transport Chain
- C. Glycolysis
- D. Pyruvic acid oxidation

2. The diagram shows a plant and a human exposed to intense sunlight.



Which pigment protects the parts L and M from the effect of intense sunlight?

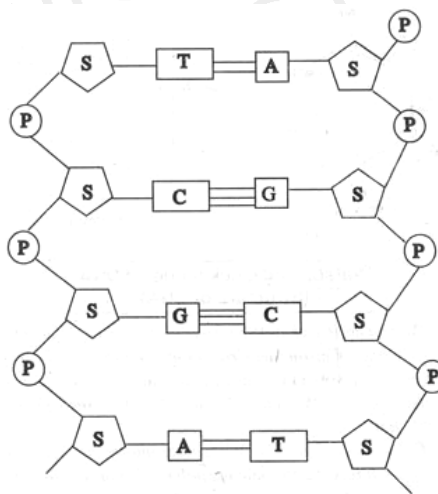
- A. Chlorophyll a
 - B. Chlorophyll b
 - C. Xanthophyll
 - D. Carotenoid
3. The diagram shows a section of a buccal and nasal cavity. Which structure prevents the entry of food into nasal canals?



4. Structurally bacteriophages differ from the usual viruses due to

- A. A protein coat.
- B. A core of DNA or RNA.
- C. independent replication in a host cell.
- D. a tail region made of protein.

5. The diagram shows structure of DNA with complementary pairing of nitrogenous bases and linear arrangement of nucleotides.



Which chemical bond is formed between two nucleotides of a strand to form a linear arrangement?

- A. Hydrogen bond
 - B. Sigma bond
 - C. Double bond
 - D. Phosphodiester bond
6. A disease associated with the accumulation of lipids in brain cells is

- A. Tay sach's disease.
- B. Gaucher's disease.
- C. Krabbe's disease.
- D. Parkinson's disease.

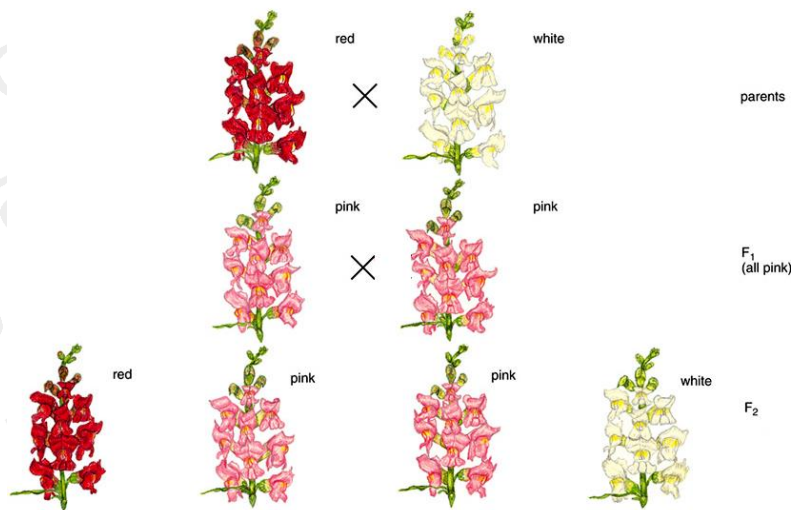
7. In which of the following organs does synthesis of urea take place?

- A. Liver
- B. Skin
- C. Kidney
- D. Bladder

8. Which of the following is TRUE about bile?

- A. It emulsifies fats.
- B. It contains urea from the liver.
- C. It contains enzymes which digest fats.
- D. It decreases the pH of intestine.

9. The diagram shows a cross resulting in incomplete dominance.

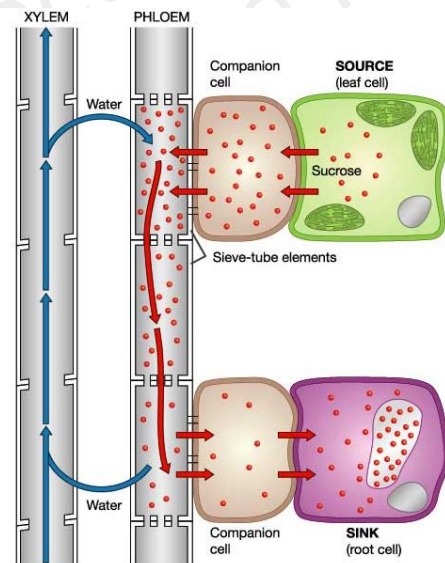


What will be the genotype of this cross?

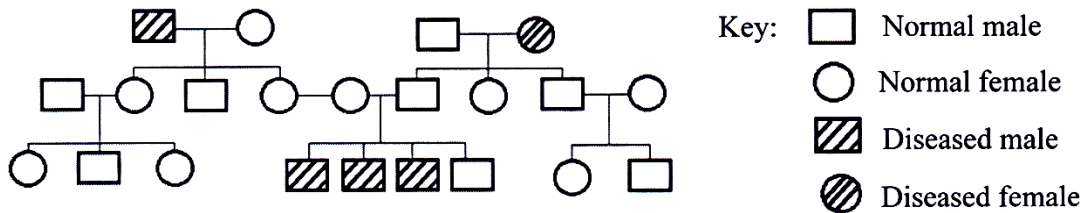
- A. 1 : 2 : 1
- B. 3 : 1
- C. 1 : 1
- D. 1 : 2

10. The diagram shows transport of prepared food from source to sink. Which theory supports the mechanism shown in the diagram?

- A. Root pressure theory
- B. Dixon and Joly theory
- C. Pressure flow theory
- D. Capillary action theory



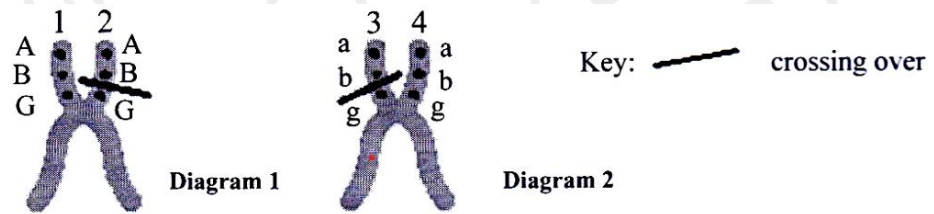
11. The pedigree chart with a key below shows a possible pattern of inheritance for human albinism (lack of skin pigment).



Which of the following statement is correct?

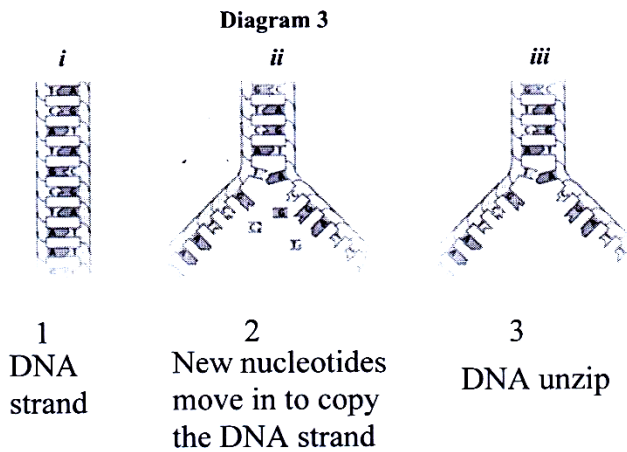
- A. People with albinism are homozygous for this disease.
- B. The gene for normal skin pigmentation is recessive.
- C. There are two genes that code for albinism.
- D. Albinism is a sex-linked character.

12. The diagram (1 & 2) represent pairs of homologous chromosomes. During crossing over in meiosis random segregation of genes takes place. Which genotype will be produced in this case?



	1	2	3	4
A	ABG	abG	ABg	abg
B	ABG	aBG	Abg	abg
C	ABG	ABG	abg	abg
D	ABG	aBg	ABg	abg

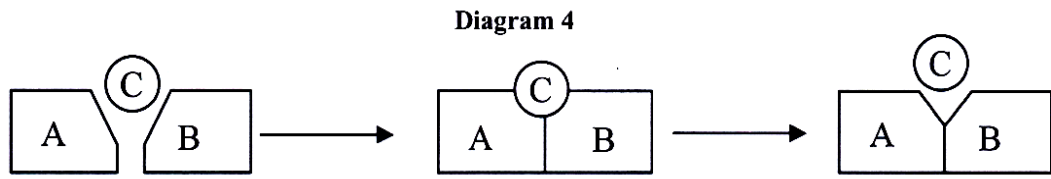
13. The diagram 3 (i, ii and iii) represent some steps of DNA replication.




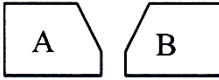

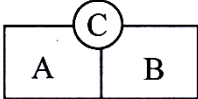
Which of the following is the correct order?

- A. i → ii → iii
- B. i → iii → ii
- C. ii → iii → i
- D. iii → i → ii

14. The diagram 4 shows an enzyme catalyzed reaction demonstrating the lock and key model.



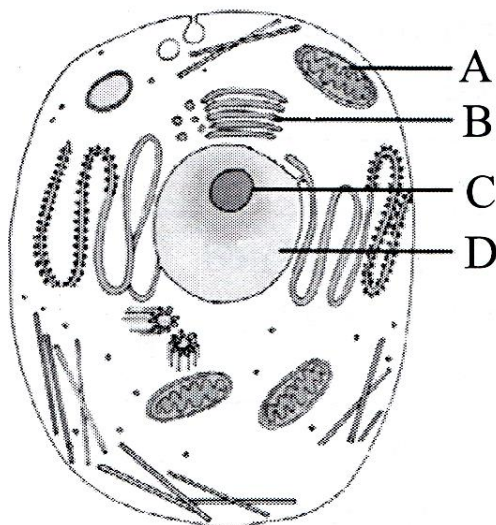
Which parts of the diagram represent the substrate?

- A. 
- B. 
- C. 
- D. 

15. The diagram 5 shows an eukaryotic cell.

Which organelle does not contain nucleic acid?

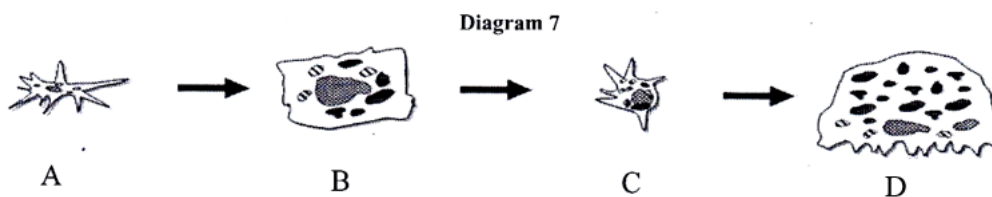
Diagram 5



16. How do vaccines prevent diseases?

- A. They stop antigen triggering an immune response.
- B. They stimulate the production of specific antibodies.
- C. They inhibit the inflammation response.
- D. They restrict the vector ability to inhabit a variety of environments.

17. The cells shown in the diagram 7 are related to bones. Which of the cells functions in the break down and reabsorption of bone tissues?



18. What does mitosis produce to assist in the maintenance of health?

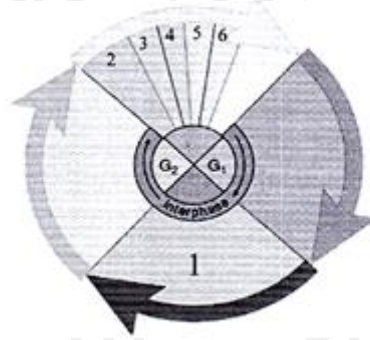
- A. Gametes to ensure
- B. Polypeptides to ensure cell growth
- C. Prions to protect cells against cancer
- D. New cells to replace worn out cells

19. Some cellular organelles are bound by a single membrane, while other organelles have two membranes around them.

Which of the following is correct?

	Single Membrane	Double Membrane
A.	Peroxisome and Lysosome	Nucleus and Chloroplast
B.	Chloroplast and Lysosome	Nucleus and Peroxisome
C.	Peroxisome and Chloroplast	Lysosome and Nucleus
D.	Nucleus and Lysosome	Chloroplast and Peroxisome

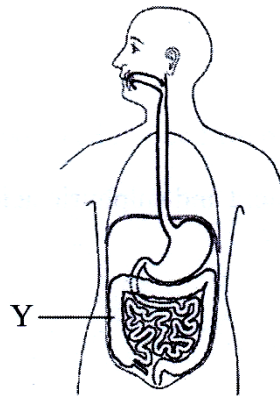
20. In the diagram showing the cell cycle G_1 and G_2 represents periods of intensive synthesis within the cytoplasm.



Which of the following correctly identifies the cellular events (1, 3 and 5) associated with mitosis?

	1	3	5
A.	Cytokinesis	Prophase	Telophase
B.	Cytokinesis	Metaphase	Telophase
C.	DNA Synthesis	Metaphase	Cytokinesis
D.	DNA Synthesis	Prophase	Cytokinesis

21. The diagram shows the alimentary canal of a man.



The effect of the removal of organ Y from the system would lead to reduced

- A. Breakdown of cellulose.
- B. Secretion of proteases.
- C. Uptake of fatty acids and glycerol.
- D. Reabsorption of water.

22. Which of the following is a set of macro-molecules?

- A. Cellulose, water and collagen
- B. Cellulose, water and wax
- C. Oxygen, collagen and water
- D. Cellulose, collagen and wax

23. Which of the following processes is used to isolate various components of the cell?

- A. Magnification
- B. Fractionation
- C. Resolution
- D. Contrast

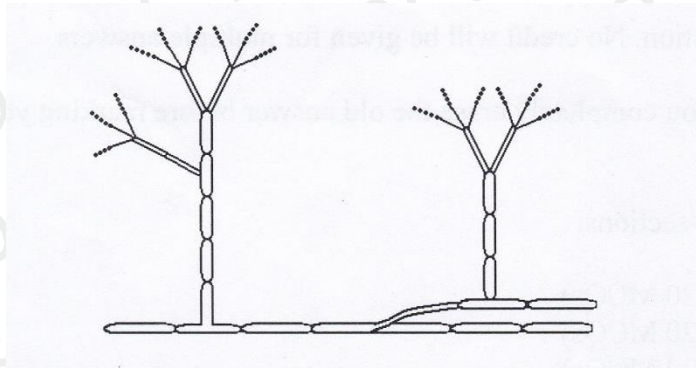
24. Influenza and measles viruses cause diseases in humans. Which of the following is a similarity between these two viruses?

- A. Both are enveloped RNA viruses
- B. Both are naked RNA viruses
- C. Both are enveloped DNA viruses
- D. Both are naked DNA viruses

25. Algae are different from plants as

- A. They lack chlorophyll.
- B. They have unicellular sex organs.
- C. The cell wall is absent.
- D. The zygote is protected by the parent body.

26. The diagram shows a fungus.



Which of the following features of the fungus is shown in the diagram?

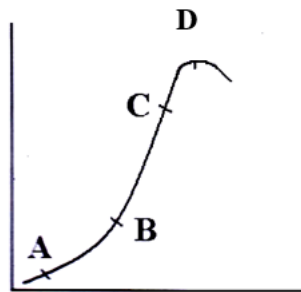
- A. Coenocytic hyphae
 - B. Unbranched mycelium
 - C. Conidia in bunches
 - D. Branched conidiophores
27. Which of the following is an example of an internal factor influencing the growth rate in living organisms?
- A. Oxygen
 - B. Nutrition
 - C. Water
 - D. Hormones
28. A person with Turner's syndrome lacks
- A. Both X and Y chromosomes.
 - B. One X chromosome.
 - C. One Y chromosome.
 - D. One autosome.
29. In a plant where $2n = 24$, what will be the total number of chromatids present during prophase 1 of meiosis?
- A. 12
 - B. 24
 - C. 48
 - D. 96

30. Which of the following correctly describes the temperate deciduous forest ecosystem found in Pakistan?

- I. The average rainfall is less than 250-500mm (10-20 inches)
- II. Moderate temperature ranging from 4°C to 30°C
- III. The soil is greyish brown, fertile and rich in organic matter

- A. I and II
- B. I and III
- C. II and III
- D. I, II and III

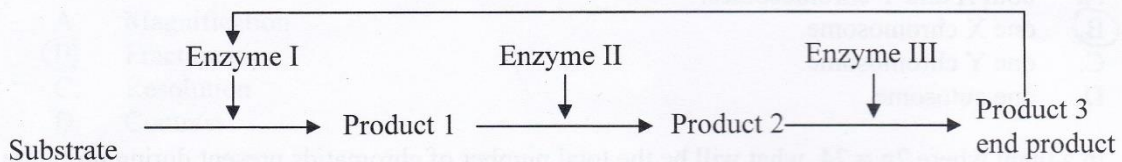
31. The figure shows a rabbit population's growth curve. Which option shows the part of the curve where the rate of population growth is the slowest?



32. Phospholipids are derivatives of phosphatidic acid. Each molecule of phospholipids consists of:

- A. Two molecules of fatty acid, one molecule of glycerol and one phosphoric acid.
- B. One molecule of fatty acid, two molecules of glycerol and two phosphoric acid.
- C. Two molecules of fatty acid, two molecules of glycerol and one phosphoric acid.
- D. One molecule of fatty acid, two molecules of glycerol and one phosphoric acid.

33. What is the role of product 3 in the given reaction?



- A. It accelerates the activity of enzymes I.
- B. It inhibits the activity of enzyme I.
- C. It does not change the activity of enzyme I.
- D. It causes denaturing of enzyme I.

34. Cancer cells can be differentiated from normal cells as

- A. They have extra chromosomes.
- B. They possess high nucleus to cytoplasmic ratio.
- C. They have prominent nucleus.
- D. They have less number of chromosomes.

35. Why is the use of bacteria preferred in genetic engineering for insulin production?

- A. Each bacterial cell is capable of producing insulin itself.
- B. Bacterial cell provides catalyst for insulin production.
- C. A simpler version of human insulin molecule is produced.
- D. Bacteria grow rapidly to produce large amounts of insulin.

36. Which of the following cells is responsible for secreting heparin?

- A. Neutrophil
- B. Basophil
- C. Eosinophil
- D. Lymphocyte

37. Following are some events of a phase of growth in plants.

- I. The walls of cells become thicker.
 - II. The walls of tissues become pitted.
 - III. New structural features develop.
- A. Cell division.
 - B. Elongation.
 - C. Maturation.
 - D. Differentiation.

38. Which of the following correctly identifies the causative agent of each of the given sexually transmitted diseases?

	Gonorrhoea	Syphilis	Genital Herpes
A.	Virus	Bacterium	Bacterium
B.	Bacterium	Virus	Virus
C.	Bacterium	Bacterium	Virus
D.	Virus	Virus	Bacterium

39. How many sperms and ova will be produced from 100 primary spermatocytes and 100 primary oocytes respectively?

- A. 100 sperms and 100 ova
- B. 100 sperms and 400 ova
- C. 400 sperms and 100 ova
- D. 100 sperms and 50 ova

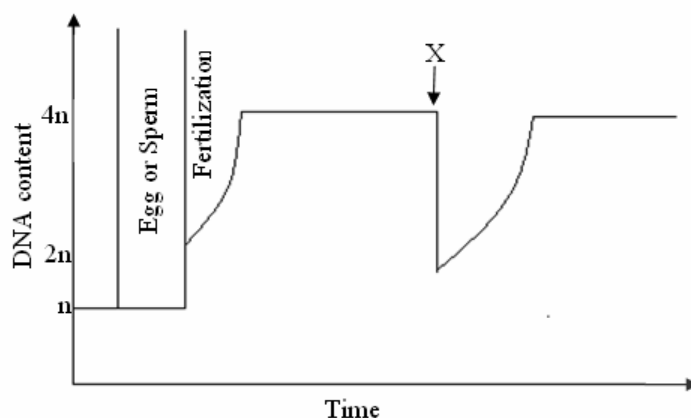
40. In which of the following diseases / disorders in excess melanophore stimulating hormone secreted?

- A. Scurvy
- B. Albinism
- C. Cushing syndrome
- D. Addison's disease

41. What is the role of "primers" in Polymerase Chain Reaction (PCR)?

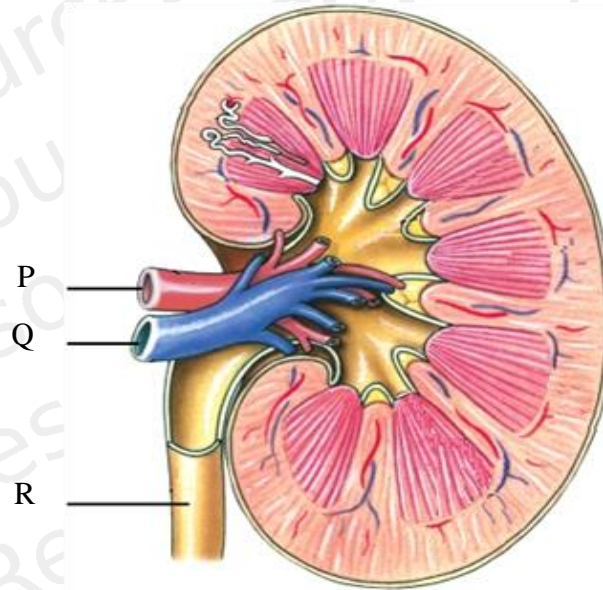
- A. They are required by an enzyme to start the process.
- B. They provide suitable temperature for the reaction.
- C. They are enzymes that carry out DNA replication.
- D. They are the target DNA with desired genes.

42. The following graph represents the changes in the quantity of DNA at different stages in a cell cycle. Which stage is represented by "X"?



- A. Replication
- B. Prophase
- C. Cytokinesis
- D. Metaphase

43. The diagram shows the section of a mammalian kidney.



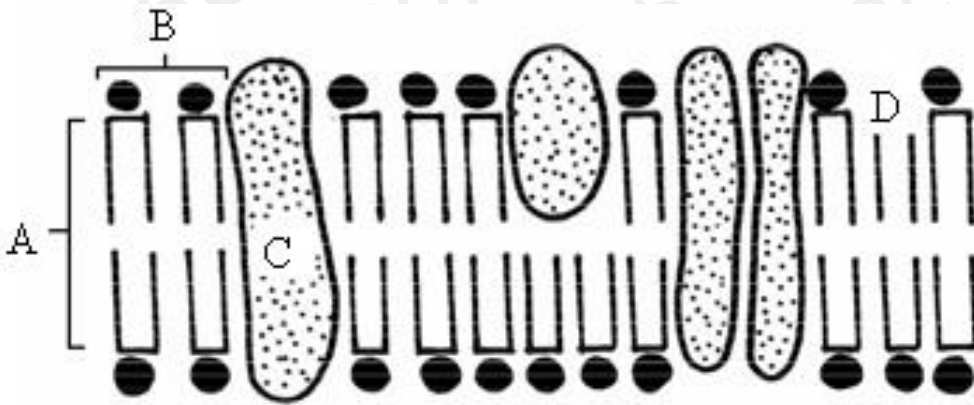
Which substance is normally not found in structure “R” of a healthy person but is found in structures “P” and ‘Q’?

- A. Ammonia
 - B. Sugar
 - C. Urea
 - D. Water
44. A plant cell whose cell wall is removed for producing transgenic plants is known as a
- A. nucleoplast
 - B. protoplast
 - C. cytoplasm
 - D. tonoplast
45. The normal rate of breathing in a human adult is 15-20 times per minute. What happens if more thyroxin is released in the blood?
- A. Breathing rate increases
 - B. Breathing rate remains unchanged
 - C. Breathing rate decreases
 - D. The process of breathing stops

46. Where does the breakdown of fatty acids to succinate take place?

- A. Golgi bodies
- B. Plastids
- C. Glyoxisomes
- D. Peroxisomes

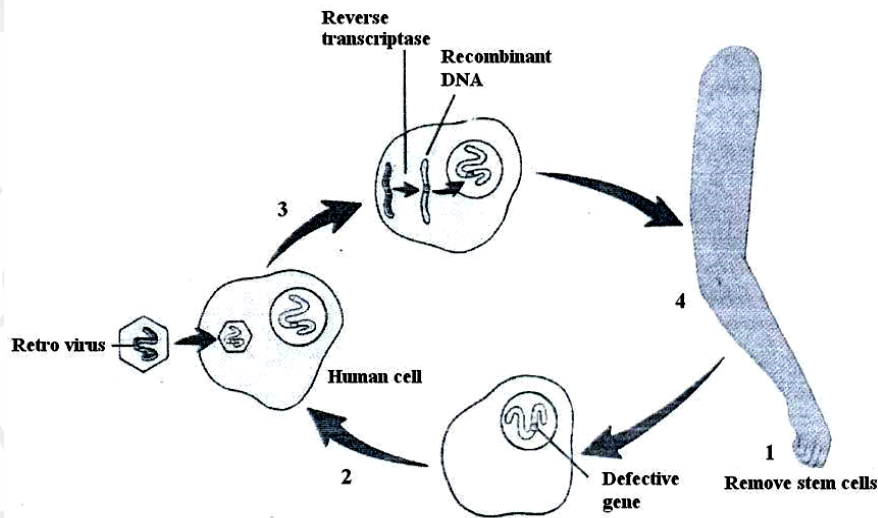
47. The diagram represents a model of plasma membrane. Which of the labelled parts is hydrophobic in nature?



48. The offspring in F1 generation have 50% chance for each of the blood groups A and AB. What is the genotype of their parents?

- A. $I^A I^A$ and $I^B i$
- B. $I^A I^B$ and $I^B i$
- C. $I^A i$ and $I^B I^B$
- D. $I^A I^B$ and $I^A i$

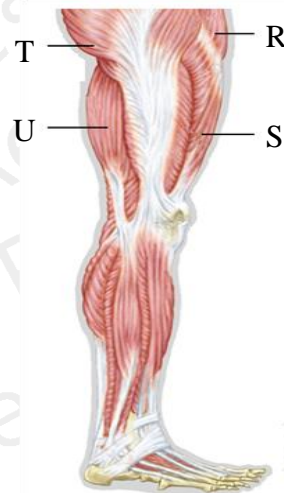
49. The diagram shows ex-vivo gene therapy in humans.



A person suffering from severe combined immunodeficiency syndrome (SCID) lacks which enzyme?

- A. Reverse transcriptase
- B. Adenylate cyclase
- C. Adenosine deaminase
- D. Restriction enzyme

50. Four sets of muscles of a human leg are shown in the diagram. Which of the following pairs of muscles will contract simultaneously to straighten the leg?



- A. R and S
- B. R and U
- C. T and U
- D. T and S