SAMPEL PERCUMA

Soalan KBAT Biologi STPM Semester 1

Set penuh: Kertas Percubaan STPM

Sem 1 · Biologi

Sampel ini: 8 muka surat. Set penuh ada:

- 3 fail PDF
- Semester 1: kertas percubaan (trial) negeri, subjek yang dipilih + skema
- Blueprint 30 hari Semester 1 (setiap subjek)
- Semester 3: percubaan 2024, 10 subjek, banyak negeri, soalan + skema dalam satu fail

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Sampel bermula di muka surat sebelah

Section A [15 *marks*]

Answer **all** *questions.*

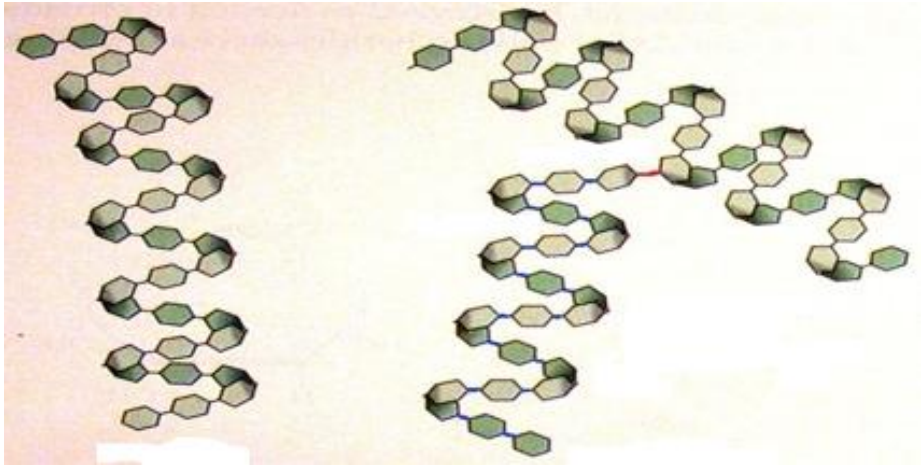
1.

- Allows water to be a suitable habitat.
- Optimum temperature maintained within cells and bodies.

The statement above state some of the role of water in living organisms. Which of the following physical properties of water is best to describe the above statement?

A. Solvent
B. High surface tension
C. High specific heat capacity
D. High latent heat of vaporisation

2. Two forms of a starch molecule are shown in the diagram below :



P Q

Which bonds will be broken when a molecule of Q is hydrolysed?

I. α1,4 II. β1,4 III. α1,6 IV. β1,6

A. I only B. II only C. I and III D. II and IV

3. What best describes an electron microscope in comparison with a light microscope?

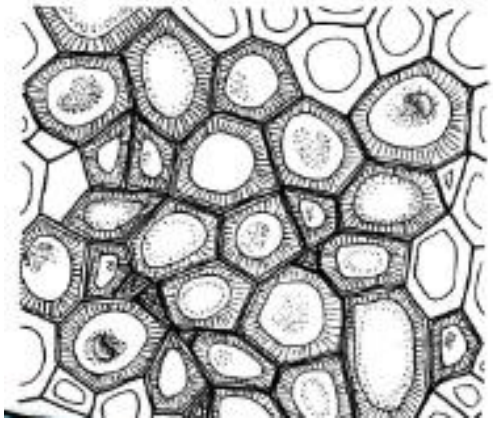
	magnification	***resolution***
A.	higher	higher
B.	higher	lower
C.	lower	higher
D.	lower	lower

4. A protein is synthesized by a ribosome on the rough endoplasmic reticulum. Which of the followings list locations that this protein might be used ?

   I. In the lysosome
   II. Outside the cell
   III. In the cytoplasm
   IV. In the cell membrane

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

5. The following diagram shows one types of plant cells.



   Which of the following statements are best describe the diagram above?

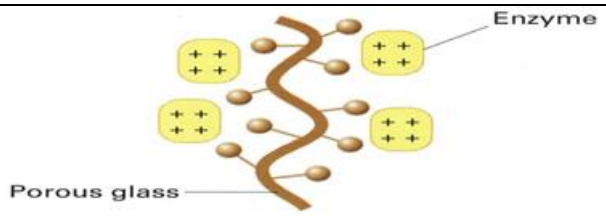
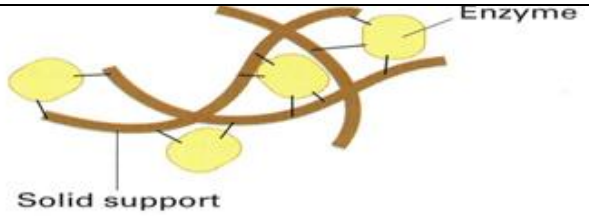
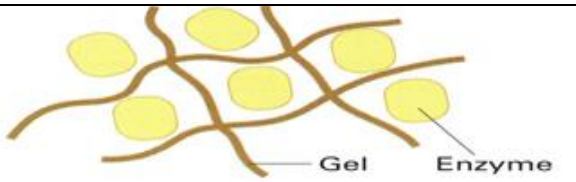
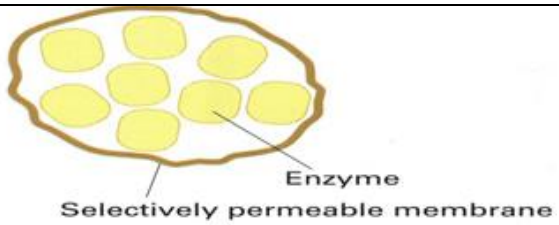
   I. It is collenchyma cells.
   II. It is sclerenchyma cells.
   III. It consists of dead cells
   IV. It consists of living cells.
   V. It consists of cell which loosely arranged
   VI. It consists of cells which are tightly packed together

   A. I, III and V B. I, IV and VI C. II, III and V D. II, III and VI

6. Which molecules in cell surface membranes contribute to cell recognition?
   A. glycolipids, glycoproteins, proteins
   B. cholesterol, phospholipids, proteins
   C. phospholipids, glycoproteins, proteins
   D. cholesterol, glycolipids, phospholipids

7. What can we expect to observe if we place a cell inside a solution where the cell's Ψ is equal to -0.3 kPa and that of the solution is -0.9 kPa?
   A. The cell will burst
   B. Water will move into the cell
   C. Water will move out of the cell
   D. Water will not move into or out of the cell

10. The diagram below shows different methods of immobilization enzyme.

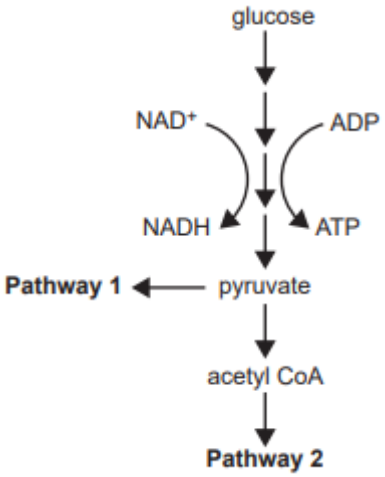
	Diagram		Method
I.		(a)	Entrapment within a gel
II.		(b)	Adsorption onto an insoluble matrix
III.		(c)	Covalent binding onto a solid support
IV.		(d)	Encapsulation behind a selectively permeable membrane

	I	***II***	***III***	***IV***
A.	(a)	(b)	(c)	(d)
B.	(b)	(c)	(a)	(d)
C.	(c)	(d)	(b)	(a)
D.	(d)	(a)	(b)	(c)

11. Which of the following best describes the role of chemiosmosis in oxidative phosphorylation ?

A. Chemiosmosis is the breakdown of ATP into ADP and inorganic phosphate.
B. Chemiosmosis is the movement of ions down their electrochemical gradient, which generates ATP.
C. Chemiosmosis is the movement of electrons down their electrochemical gradient, which generates energy in the electron transport chain.
D. Chemiosmosis is the movement of chemical dissolved in water down their concentration gradient, across the mitochondrial membrane.

12. Diagram below shows a simplified diagram summarising a series of biochemical processes in a plant cell.



The final products of Pathway 1 are produced in the

A. cristae.
B. cytosol.
C. mitochondrial matrix.
D. chloroplast membranes

13. During photosynthesis
    A. ADP and NADPH are created during the Krebs cycle and carried to the stroma of the chloroplasts.
    B. ADP and NADH are used in the electron transport chain after being created in the light-dependent stage.
    C. ATP and NADPH are created in the grana of the chloroplasts and are used in the light-independent stage.
    D. ATP and NADH created in the light-independent stage are transported to the chloroplasts' thylakoid membranes.

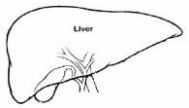
14. Which of the following statements is **not** true about C_4 plants?
    A. Krantz anatomy is present.
    B. It uses Rubisco to fix carbon into a four-carbon sugar.
    C. It possesses a functioning Calvin cycle for carbon fixation.
    D. It possesses well developed bundle sheath surrounding leaf veins.

Section B [15 *marks*]

Answer **all** *questions.*

Write the answers in the spaces provided.

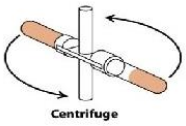
16. The steps below are the procedures carried out in cell fractionation to isolate cell organelles.

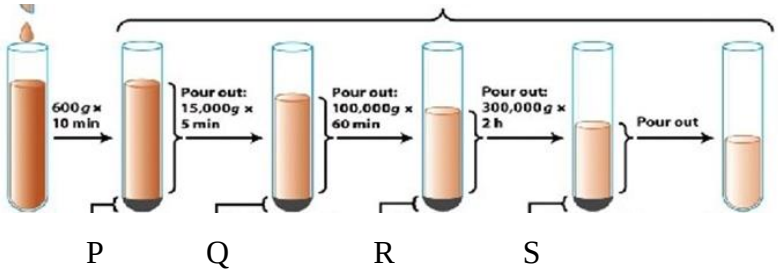


Step 1: Slice → Tissue → Buffer solution → ***Step 2***

Filter

Step 3: Ultracentrifugation





P Q R S

(a) What is ***Step 2***? [1 mark]

……

(b) What other properties must the buffer solution have? [2 marks]

……

……

(c) Suggest which organelles are present in sediment Q and state the function of these organelles. [2 mark]

……

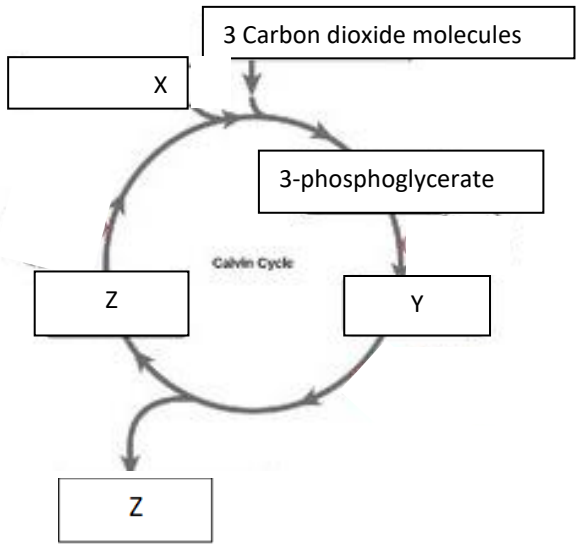
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(d) If prokaryotic cells are used instead of liver cells, which tubes will be the result? Give reason for your answer. [2 marks]

……

……

17. The Calvin cycle with its sequential reactions are shown in the diagram below.



(a) Name X and Y. [2 marks]

……

……

(b) Based on the diagram, how many molecules of Z will exit the cycle and how many of them are used to regenerate molecule X and complete the cycle? [2 marks]

……

……

(c) Where does this cycle occur in a C_3 plant and in a C_4 plant? [2 mark]

……

……

(d) If light dependent reaction does not occur, explain the effects it would have on this cycle? [2 marks]

……

……

Section C [30 *marks*]

Answer **two** *questions only*.

You may answer all the questions **but**, *only the first* **two** *answers will be marked. Write the answers on the answer sheets provided. Begin each answer on a new page of the answer sheet.*

18. (a) Lysosomes are organelles containing hydrolytic enzymes. They are manufactured within the cells of living organisms. Describe how lysosomes are manufactured in these cells. [10 marks]

    (b) Various processes occur to help the transport of substances into and out of a cell. Compare and contrast the processes of facilitated diffusion and active transport that take place across a plasma membrane. [5 marks]

19. (a) The process of glycolysis requires many types of enzymes. Describe any **three** of the classes of enzymes involved in glycolysis. [9 marks]

    (b) Explain how the structures of storage polysaccharides in both animal and plants suit their functions. [6 marks]

20. (a) Discuss the similarities and differences between aerobic respiration and photosynthesis. [8 marks]

    (b) Describe the role of energy carrier molecules, NADH and $FADH_2$ in the production of ATP in oxidative phosphorylation. [7 marks]

MARKING SCHEME

SECTION A (MULTIPLE-CHOICE)

Answer key

Question Number	Key	Question Number	Key	Question Number	Key
1	**C**	6	**A**	11	**B**
2	**C**	7	**C**	12	**B**
3	**A**	8	**C**	13	**C**
4	**B**	9	**D**	14	**B**
5	**D**	10	**B**	15	**C**

Section B

Question	Suggested answer	Marks
16.	(a) Homogenisation	1
	(b) Ice-cold temperature	1
	Isotonic	1
	(c) Mitochondria	1
	Produce energy (in the form of ATP)	1
	(d) R and S only	1
	Because prokaryotic cells do not have nucleus (which form sediment in P) and do not have endoplasmic organelles (which form sediment in Q)	1
17.	(a) Ribulose bisphosphate //RuBP	1
	1,3 bisphosphoglycerate //bisphosphoglycerate	1
	(b) 1 will exit the cycle and 5 will be used to regenerate RuBP	1 + 1
	(c) In mesophyll cell of C_3 plants; in bundle sheath cell of C_4 plants	1 + 1
	(d) This cycle will not occur	1
	Because it requires ATP and NADPH which are produced during light reaction	1
	(or any logical answer containing this idea)	1

TAMAT SAMPEL

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