SAMPEL PERCUMA

Trial STPM 2021 Biologi Semester 1 Muar (964/1)

Set penuh: Kertas Percubaan STPM

Sem 1 · Biologi

Sampel ini: 7 muka surat. Set penuh ada:

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

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Sampel bermula di muka surat sebelah

Name: ……. **Class: ……**

PANITIA BIOLOGI TINGKATAN ENAM DAERAH MUAR

964/1 STPM 2021

BIOLOGY

PAPER 1

0ne and a half hours

Instructions to candidates:

DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE ALLOWED TO DO SO.

*Answer **all** questions in Section A.*

*Answer **all** questions in Section B.*

*Answer **two** questions only in Section C.*

All working should be shown. For numerical answers, units should be quoted wherever appropriate.

Answers may be written in English or Malay.

Fill in your personal details on the front page.

For teacher's use	
Section A	
Section B	
16	
17	
Section C	
Total	

This question paper consists of 7 printed pages

Section A
[15 marks]
Answer all the questions in this section

1. An amino acid which is able to neutralize both an acid and a base is said to be
   A. bipolar
   B. non polar
   C. amphoteric
   D. an electron donor

2. In an analysis of a DNA fragment that consist of 3000 base pairs, 30% are of cytosine. How many units of thymine can found in this DNA fragment?
   A. 400
   B. 800
   C. 1200
   D. 1600

3. The chlorophyll pigments can be separated by paper chromatography. The rate of movement of the pigment depends on
   I the size of the component molecules
   II the different solubility in the solvent
   III the differential adsorption of the solutes to the paper

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

4. Which of the following consists of lipoprotein membranes?
   I Middle lamella
   II Myelin sheath
   III Smooth endoplasmic reticulum

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

10. Which of the following statements about the Michaelis-Menten constant (K_m) is true?
    A. The higher the K_m value means that more product is produced at the end of enzyme catalyzed reaction
    B. The higher the K_m value means that less product is produced at the end of the enzyme catalyzed reaction
    C. The higher the K_m value means that the affinity of enzyme towards its substrate is increased
    D. The higher the K_m value means that the affinity of enzyme towards its substrate is decreased

11. Heavy metal ions such as arsenic
    A. binding permanently on the allosteric site of the enzyme
    B. binding permanently on the active site of the enzyme
    C. binding reversibly on the allosteric site of the enzyme
    D. binding reversibly on the active site of the enzyme

12. Aerobic respiration produces more ATP for every molecule of glucose compared to anaerobic respiration because
    A. The enzymes involved in aerobic respiration is more efficient
    B. Lactic acid produced in animal cell in anaerobiosis reduces enzyme efficiency
    C. All the carbons in glucose is oxidized to carbon dioxide in aerobiosis
    D. Anaerobiosis uses up the energy generated by mitochondria

13. When oxygen is not available to a skeletal muscle cell, NADH formed during glycolysis does not pass hydrogen atoms to the electron transport chain. Instead, it passes the hydrogen atoms to
    A. Pyruvate
    B. Acetyl coenzyme A
    C. ADP
    D. Glucose

14. Calvin cycle in photosynthesis occurs in four phases. Which of the following occurs in the reduction phase?
    A. Ribulose bisphosphate binds to carbon dioxide
    B. NADPH is oxidized to NADP+
    C. 6 carbon molecule splits to two carbon molecules
    D. Carbon dioxide is reduced to six carbon molecules

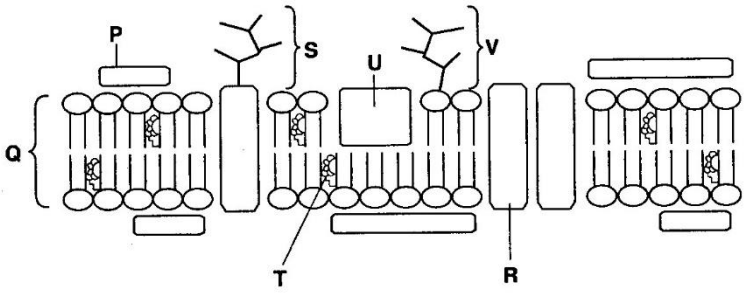
15. Which of the following occurs during the light independent phase of photosynthesis in C4 plants?
    A. During the light independent phase of photosynthesis, carboxylation of oxaloacetate produces malate in mesophyll cells
    B. During the light independent phase of photosynthesis, carboxylation of phosphoenolpyruvate produces oxaloacetate in bundle sheath cells
    C. During the light independent phase of photosynthesis, carboxylation of phosphoenolpyruvate produces malate in bundle sheath cells
    D. During the light independent phase of photosynthesis, carboxylation of phosphoenolpyruvate produces oxaloacetate in mesophyll cells

Section B

[15 marks]

*Answer **all** questions in this section*

16. The diagram below shows a section of plasma membrane



a) Identify components S, T, U and V.

S: ……..

T: ……..

U: ……..

V: ……..

[2 marks]

b) Give three functions of structure T in the plasma membrane.

……

……

……

[3 marks]

c) Describe the transport of a named molecule across the plasma membrane when using component R.

……

……

……

[3 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 sheet provided. Begin each answer on a new page of the answer sheet.*

18 a) With the aid of diagrams describe two classes of lipids.

[12 marks]

b) Distinguish a bacteria chromosome from a eukaryotic chromosome.

[3 marks]

19 a) Describe the application of biosensor in monitoring blood glucose level.

[9 marks]

b) Describe photosystem that are involved in light dependent reaction.

[6 marks]

20 a) Describe the effect of cyanide (CN^-) to electron transport system in aerobic respiration.

[8 marks]

b) With suitable example, describe the application of anaerobic respiration in food industry.

[7 marks]

Trial Sem 1 STPM 2021 - Muar
Answer Scheme

Section A

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

Section B

16 a)	S: glycoprotein T: cholesterol U: integral protein/ intrinsic protein. V: glycolipid	2m
b)	P1- regulate fluidity of cell membrane P2- increase fluidity of plasma membrane when temperature reduces P3- decrease fluidity/ increase rigidity of plasma membrane when temperature increases P4- decrease permeability of plasma membrane to polar molecules P5- increase permeability of plasma membrane to non-polar molecules	Any 3
c)	P1- ions (example) P2- are transported by facilitated diffusion P3- through the open channels of component R (channel/ pore protein) P4- down concentration gradient.	Any 3
17 (a)	Photolysis of water	1m
(b)	* Chlorophyll a is photoactivated after it absorbs light. * Electron is excited to a higher energy level and accepted by primary electron acceptor. * When the electron is passed along the electron carriers, energy is released to	3m

Triglyceride	Phospholipid	Steroid (cholesterol)
Molecule made up of one glycerol and three fatty acids	Molecule made up of one glycerol, 2 fatty acid, one phosphate and choline	4 ring hydrocarbon structure
Esterification occurs between molecules to form ester bonds and 3 water molecules	Esterification occurs between molecules to form ester bonds and 3 water molecules	Side chains differentiate between different types of steroids
Fatty acids can be either saturated or unsaturated	Molecule has a hydrophilic head and a hydrophobic tail	less soluble in water/ more soluble in non polar solvents (organic solvent)
Molecule is hydrophobic	Molecule is amphipathic	Molecule is amphopathic
Suitable as energy storage in adipose tissues	as major component of cell membrane to gives its fluidity	as a component in cell membrane to regulate the fluidity/ as precursor for steroid hormone, bile salts, vitamin D

each molecule 6m (any two molecules) : 1m for category, 1m for diagram, 1m for label, 3m for description.

(b)

Comparison between DNA of bacteria and eukaryote

Bacteria	Eukaryote
circular DNA	Linear DNA
Naked DNA	DNA with protein histone
lie freely in nucleoid region in cytoplasm, there is no nucleus	contain in nucleus
contain one chromosome only	contain several chromosomes
smaller/ shorter	bigger/ longer

19

(a)

- glucose in blood is converted to gluconic acid and hydrogen peroxide
- by glucose oxidase as the immobilized enzyme
- electrons is collected
- amount of electron is correspond to the level of glucose
- the biochemical signal is detected & converted into electrical signal by transducer
- electrical signal is then amplified
- sent to a microelectronics and data processor
- the electrical signal is used to produce a measurable sign
- level is shown in digital display

TAMAT SAMPEL

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