



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY
FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE (MAJOR AND MINOR)	
QUALIFICATION CODE: 07BOSC	LEVEL: 6
COURSE CODE: CEB601S	COURSE NAME: CELL BIOLOGY
SESSION: JULY 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS	
<ol style="list-style-type: none">1. Answer ALL the questions.2. Write clearly and neatly.3. Number the answers clearly.4. All written work MUST be done in BLUE or BLACK ink.	

PERMISSIBLE MATERIALS

Scientific Calculator

THIS QUESTION PAPER CONSISTS OF EIGHT (8) PAGES
(Including this front page)

SECTION A: MULTIPLE CHOICE QUESTIONS

[20]

- There are 20 multiple choice questions in this section. Each question carries 1 mark.
- Answer **ALL** questions by selecting the **LETTER** with the correct answer.

1. Photograph which is taken from a microscope is known as

- A. Macrograph
- B. Monograph
- C. Micrograph
- D. Pictograph

2. _____ is the capacity to distinguish between two adjacent points.

- A. Magnification
- B. Resolving power
- C. Ionization
- D. Multiplication

3. Amino acids are_____.

- A. Building blocks of lipids
- B. Building blocks of proteins
- C. Building blocks of carbohydrates
- D. Building blocks of nucleic acids

4. In which phase of the cell cycle is DNA replicated?

- A. G1 phase
- B. S phase
- C. G2 phase
- D. M phase

5. All of the following are part of a prokaryotic cell except;
- A. DNA
 - B. A cell wall
 - C. Ribosomes
 - D. An endoplasmic reticulum
6. In a plant cell, DNA may be found
- A. only in the nucleus and mitochondria.
 - B. only in the nucleus and chloroplasts.
 - C. in the nucleus, mitochondria, and chloroplasts.
 - D. in the nucleus, mitochondria, chloroplasts, and peroxisomes.
7. Movement of phospholipids to opposite sides is called;
- A. Facilitated diffusion
 - B. Lateral diffusion
 - C. Transverse diffusion
 - D. Simple diffusion
8. Which of the following is an example of peripheral membrane protein?
- A. Insulin receptor
 - B. Glycolipid transfer proteins
 - C. Glycophorin
 - D. Integrin
9. Which of the following deoxyoligonucleotides will hybridize with a DNA containing the sequence (5')AGACTGGTC(3')?
- A. (5')CTCATTGAG(3')
 - B. (5')GAGTCAACT(3')
 - C. (5')TCTGACCAG(3')
 - D. (5')GACCAGTCT(3')

10. Which of the following statements is true of Na⁺/K⁺-adenosine triphosphatases?
- A. Their actions maintain a membrane potential with a value often of approximately -60 mV; the interior of the cell being positive with respect to the exterior
 - B. They use the free energy from the hydrolysis of ATP to transport K⁺ out the cell and Na⁺ into the cell
 - C. They are tetramers, consisting of four equally sized polypeptide chains.
 - D. They indirectly control the volume of the cell
11. The mobile carrier protein that transports fructose to inside the cell using energy is;
- A. SGL T-1
 - B. GLUT-5
 - C. GLUT-2
 - D. All the above
12. Which of the following statements about G proteins is false?
- A. They are involved in signal cascades
 - B. They bind to and are regulated by guanine nucleotides
 - C. They become activated when bound to GDP
 - D. They must be active before the cell can make needed cAMP
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13. Which of the following statements is **FALSE**?
- A. Cell walls are found in plants but not in animals
 - B. Cell walls are found inside the plasma membrane of a cell
 - C. The main constituent of a primary cell wall is cellulose molecules
 - D. Secondary cell walls contain lignin, a substance that makes them stronger than primary cell walls

14. The chemical equation for photosynthesis;
- A. $6\text{CO}_2 + \text{C}_6\text{H}_{12}\text{O}_6 \xrightarrow{\text{using sunlight}} 6\text{H}_2\text{O} + 6\text{O}_2$
 - B. $6\text{CO}_2 + 6\text{O}_2 \xrightarrow{\text{using sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O}$
 - C. $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{using sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
 - D. $6\text{O}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{using sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{CO}_2$
15. Simple nerve reflexes use signalling molecules called;
- A. Neurotransmitters
 - B. Nitric oxides
 - C. G proteins
 - D. Proteases
16. Which of the following comes under the category of cell surface receptor?
- A. Enzyme linked receptors
 - B. Ion-channel linked receptors
 - C. G protein linked receptors
 - D. All of these
17. Primer used for the process of polymerase chain reaction are _____.
- A. Single stranded DNA oligonucleotide
 - B. Double stranded DNA oligonucleotide
 - C. Single stranded RNA oligonucleotide
 - D. Double stranded RNA oligonucleotide
18. Migration of cancerous cells from the site of origin to another part of the body forming secondary tumours is called;
- A. Proliferation
 - B. Diapedesis
 - C. Metastasis
 - D. None of the above

19. At what temperature do annealing of DNA and primer takes place?

- A. 42°
- B. 54°
- C. 74°
- D. 96°

20. Which of the following statements about the generation of ATP in the electron transport chain is correct?

- A. The generation of ATP from ADP coupled to electron transfer occurs by substrate level phosphorylation as in glycolysis
- B. Electron transport generates a proton gradient across the outer mitochondrial membrane
- C. ATP synthase generation of ATP involves a rotating structure outside the inner mitochondrial membrane
- D. ATP synthase generation of ATP involves a rotating structure inside the inner mitochondrial membrane

END OF SECTION A

SECTION B

[80]

- There are **SEVEN (7)** questions in this section. Answer all Questions.

Question 1

[7]

- a) Calculate the field of view (\emptyset FOV) in μm of a microscope with a field of view index (FVI) 18 and an objective magnification of X20. (3)
- b) Define the following terminologies as used in microscopy; (4)
- Photobleaching
 - Resolution
 - Phototoxicity
 - Fluorescent in situ hybridization (FISH)

Question 2

[10]

- a) State **FOUR (4)** functions of the Nervous tissue. (4)
- b) Briefly describe the main types of muscle tissue. (6)

Question 3

[12]

- a) Use a schematic energy diagram to show how enzymes speed-up reactions. (2)
- b) Briefly, discuss **FIVE (5)** factors that affect enzyme action. (10)

Question 4

[12]

- a) Briefly describe how the movement of sodium and potassium ions takes place across the cell membrane. (6)
- b) What is the fate of absorbed glucose by tissues in Eukaryotes? (6)

Question 5

[13]

- a) The glycolysis pathway is regulated by **THREE (3)** enzymes namely; (3)
- b) Briefly explain the Electron Transport Chain/Oxidative Phosphorylation process. (10)

Question 6

[14]

- a) Schematically compare and contrast prokaryotic and eukaryotic cell cycles. (4)
- b) Briefly discuss what happens during each phase of the eukaryotic cell cycle. (10)

Question 7

[12]

- a) State **SIX (6)** basic differences between nuclear and mitochondrial DNA. (6)
- b) Elaborate on how Inositol triphosphate (IP3) and diacylglycerol (DAG): with the aid of Phospholipase C modulates signal transduction. (6)

THE END