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**P530/1**

**BIOLOGY (THEORY)**

**PAPER 1**

**November 2023**

**2 ½ HOURS**

**Uganda Advanced Certificate of Education**

**END OF TERM III EXAMINATIONS 2023**

**S.5 BIOLOGY PAPER 1**

**2 Hours 30 Minutes.**

**INSTRUCTIONS:**

*Answer all questions in section A and B.*

*Write answers to section A in the tables provided, answers to section B in the spaces provided.*

**FOR EXAMINERS' USE ONLY**

<b>Section</b>	<b>Mark(s)</b>	<b>EXAMINER'S SIGNATURE</b>
<b>A:</b>		
<b>B: No. 41</b>		
No.42		
No.43		
No.44		
No.45		
No.46		
Total		

## SECTION A (40 MARKS)

**Write letter corresponding to best choice in the box provided for each question.**

*Each question in this section carries one mark*

**1.** Which one of the following bonds maintains the primary structure of a protein.

A. Disulphide bond.

B. Hydrogen bond

C. Peptide bond.

D. Hydrophobic interactions.

**2.** The epithelium best adapted for a body surface subject to abrasion is

A. simple squamous

C. stratified columnar

B. simple columnar

D. stratified squamous,

**3.** The following organelles are bound by two limiting membranes except

A. chloroplast

C. ribosomes

B. mitochondrion

D. nucleus

**4.** Which of the following lake zones is most oxygen deprived?

A. Epilimnion

B. Thermocline

C. Littoral zone

D. Benthic

**5.** Which one of the following proteins is soluble

A. collagen

C. globulin

B. keratin

D. elastin

**6.** Which of the following type of epithelia lines the mammalian alveoli

A. Stratified epithelium

C. Cuboidal epithelium

B. Columnar epithelium

D. Squamous epithelium

**7.** Which one of the following is not true about active transport

A. Involves hydrolysis of ATP

- B. Occurs along a concentration gradient
- C. Occurs along the cell membrane
- D. The rate increases with increase in temperature

8. Which one of the following is an example of simple coiled tubular gland

- A. Mucus secreting gland
- C. Sweat gland
- B. Bruner's gland
- D. Sebaceous gland

☐

9. Which one of the following is true about end product inhibition?

- A. Inhibition is permanent
- B. End product molecules bind with enzymes
- C. It's a depiction of a positive feedback mechanism
- D. Rate of inhibition decrease with decrease in concentration of end product molecules

☐

10. A filamentous organism with a cell wall but with no chloroplast was discovered in decomposing organic matter. This organism belongs to phylum

- A. plantae
- C. fungi
- B. protocista
- D. prokaryote

☐

11. Which of the following base sequence of DNA is complementary with ACGU on mRNA?

- A. TGCA
- C. TGCT
- B. ACGU
- D. ACGT

☐

12. Cells with uniformly thickened and lignified walls are likely to be in the?

- A. phloem
- C. Sclerenchyma
- B. collenchyma
- d. parenchyma

☐

13. Birds smear oils all over their feathers from special glands near their cloaca in order to;

- A. Insulate their body against heat loss
- B. Make them water proof
- C. Conserve heat
- D. Protect them against mechanical damage

☐

14. One disadvantage of multicellular state is that individual cells?

- A. are always small

☐

- B. lose independence
- C. become less functional
- D. become less specialized

**15.** the method of discharge of secretions that involves loss of part of the cytoplasm together with the secretion is known as

- A. Endocrine
- B. Apocrine
- C. Merocrine
- D. Halocrine

☐

**16.** Which one of the plant tissue function as storage as well as support tissue

- A. phloem
- B. sclerenchyma
- C. collenchyma
- D. parenchyma

☐

**17.** Which one of the following events in meiosis explain why gametes of mammals are haploid?

- A. One replication of DNA
- B. Crossing over occurs during prophase 1
- C. Chromatid separate
- D. Homologous chromosomes

☐

**18.** Monosaccharaides are called reducing sugars because;

- A. Reduce aldehydes to ketones
- B. Reduce copper (ii) sulphate in Benedict's reagent to copper(i) oxide
- C. Able to turn Benedict's solution from white to orange
- D. Able to turn Benedict's solution to orange.

☐

**19.** An enzyme carbonic anhydrase has a zinc ion in its structure. Zinc in this case is?

- A. A co enzyme
- B. An activator
- C. A prosthetic group
- D. A co factor

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**20.** Which of the following is not true about a protein secreting cells?

- A. Prominent endoplasmic reticulum
- B. Prominent Golgi body
- C. Few ribosomes
- D. Numerous mitochondria

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**21.** The similarity between active transport and diffusion is that both;

- A. Occur against the concentration gradient
- B. Can occur in non-living tissue
- C. Require energy
- D. Require carrier proteins

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**22.** Which of the following pairs of reactants is not involved in the light independent reactions of photosynthesis?

- |                       |                              |
|-----------------------|------------------------------|
| A. NADPH and ATP      | C. RuBP and free oxygen      |
| B. ATP and carotenoid | D. Carbondioxide and enzymes |

☐

**23.** Food chains are sometimes short because

- A. Only a single species of herbivore feeds on each plant species
- B. Most of the energy in a trophic levels is lost as it passes to the next higher level.
- C. Predator species tend to be less diverse and less abundant than prey species
- D. Most producers are inedible.

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**24.** The following are terminating codons except?

- |        |        |
|--------|--------|
| A. AUG | C. UAA |
| B. UAG | D. UGA |

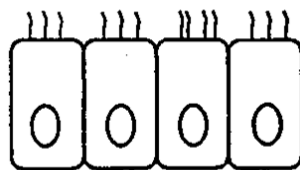
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**25.** Which of the following occurs during anaphase 1 of meiosis

- A. Chromatids draw apart at the centromere
- B. Synapsis
- C. Separation of homologous chromosomes
- D. Sister chromatids move to opposite poles

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**26.** The figure below shows the cells of a tissue in animals



*Figure 1*

Which one of the following is it most likely to be lining?

A. gut

C. Respiratory tract

B. skin

D. Blood vessel

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**27.** When DNA is analyzed, which of the following pairs of bases always occurs in the ratio of one?

A. Adenine and uracil

C. Adenine and thymine

B. Adenine and guanine

D. Adenine and cytosine

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**28.** The cell membrane component that mainly increase flexibility are;

A. Glycoproteins and glycolipids

B. Cholesterol molecules

C. Phospholipid molecules

D. Protein molecules

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**29.** Which one of the following cell organelles is associated with final stage of most cell secretions?

A. Smooth endoplasmic reticulum

B. Rough endoplasmic reticulum

C. Ribosome

D. Golgi apparatus

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**30.** The initial amino acid in the chain of most polypeptide is

A. Valine

C. glycine

B. Methionine

D. glutamic acid

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**31.** Which of the following occurs when a flaccid cells is put in a solution of higher water potential?

A. Its solute potential decreases

B. Its water potential increases

C. The gap between the protoplast and the cell wall increases

D. Protoplast shrinks

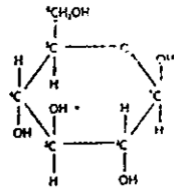
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32. The greatest loss of energy in a food chain occurs between.

- A. Producers and primary consumers
- B. Primary consumers and secondary consumers
- C. Secondary consumers and tertiary consumers
- D. Carnivores and carrion feeders

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33. The structure shown below is for



- A. Alpha glucose
- B. Beta glucose
- C. Ribose
- D. deoxyribose

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34. Which one of the following cells is the most vulnerable to HIV?

- A. T-killer cells
- B. T-helper cells
- C. T-suppressor cells
- D. B-memory cells

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35. Which one of the following **is true** of a cell plasmolysed to the extent of its protoplast leaving the cell wall

- A. Solute potential and pressure potential of the cell are equal
- B. Water potential of a cell equals to solute potential
- C. Wall pressure is positive
- D. Water potential of the cell is zero

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36. The difference shapes and functions of different proteins are determined by,

- A. The carboxyl groups of the amino acids they contain
- B. Whether or not they contain any amino acids
- C. The R groups of the amino acids they contain

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- D. The amino groups of the amino acids they contain.
- 37.** Two cells A and B have water potential of -2000Kpa and -1000Kpa respectively. Which one of the following statements is true about the cells?
- A. There is a net movement of water from Cell A to Cell B
  - B. Cell A has a less solute concentration than Cell B
  - C. Cell A has a higher concentration of water molecules than cell B
  - D. Cell A has a higher solute potential than Cell B
- 38.** Which term describes both collagen and haemoglobin molecules
- A. macromolecules
  - B. globular proteins
  - C. fibrous proteins
  - D. enzymes
- 39.** Which of the following represents a sporophyte stage in flowering plants
- A. Embryo or seed
  - B. Pollen grain or mature embryo sac
  - C. Seed or ovum
  - D. Pollen grains and ovum
- 40.** The first carbohydrate made in photosynthesis is,
- A. Ribose sugar
  - B. Glucose
  - C. Phosphoglyceraldehyde
  - D. Phosphoglyceric acid

## SECTION B (60 MARKS)

*Write answers in the spaces provided*

**41.** (a) What is meant by the following terms?

(i) Integrated pest management (IPM) (01 mark)

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(ii) Pest resurgence (01 mark)

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(iii) Indicator species

(01 mark)

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(b) Explain the causes of pest resurgence

(03 marks)

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(ii) How are lichens adapted as pioneer indicator species on a bare rock? (04 marks)

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**42.** (a) State 3 features of epithelial tissues

(03 marks)

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(b) Describe the structure of pseudostratified epithelium.

(04 marks)

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(c) Outline the functions of epithelia in the human body? (05 marks)

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**43.** Giving examples, differentiate between photosynthetic and chemosynthetic bacteria. (02 marks)

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(b) Explain how certain bacteria which require light for photosynthesis, survive under weeds in ponds and rocks. (03 marks)

(c) Describe the process that occurs in green plants leading to formation of **ATP** in presence of light (04marks)

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**44.** (a) State 3 differences between mitotic prophase and prophase 1 of meiosis? (03 marks)

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(b) Explain how meiosis leads to variation (04 marks)

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(c) How does a cancer arise?

(03 marks)

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**45.** Both the moss and the fern show alternation of generation

(a) State the dominant phase for each

(02 marks)

Moss .....

Fern .....

(b) How are the ferns better adapted to living in terrestrial environments than the

moss?

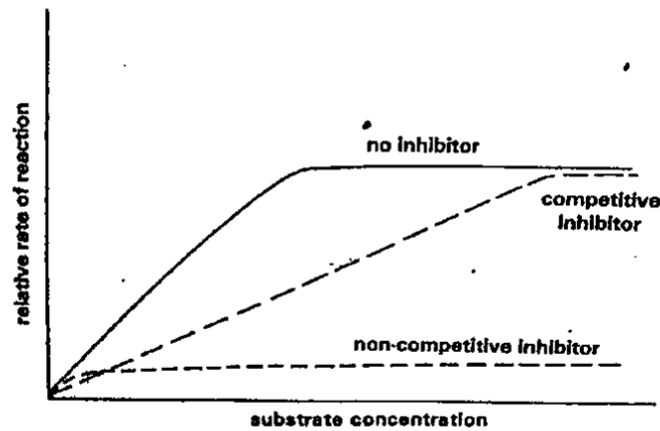
(04 marks)

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(c) Explain why in both mosses and ferns gametes are produced by mitosis as opposed

to the expected meiosis used during formation of other gametes.

(02marks)

**46.** The graph below shows the effect of competitive and noncompetitive inhibition on the rate of enzyme catalyzed reaction at increasing substrate concentration. Study it and answer the questions that follow.



(a) Explain the effect of increasing substrate concentration on the rate of reaction when;

(i) a competitive inhibitor is used

(04 marks)

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(ii) a noncompetitive inhibitor is used

(03 marks)

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(c) Explain how end product inhibition of an enzyme-controlled reaction is a negative feedback. (03 marks)

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***END***