Candidate's Name: .....

Signature:.....

Random No.						Personal No.		

(Do not write your School Name or Number anywhere on this booklet.)

P530/1
BIOLOGY
(Theory)
Paper 1
Jul./Aug. 2024
2½ hours

WAKISO-KAMPALA TEACHERS' ASSOCIATION (WAKATA)
WAKATA MOCK EXAMINATIONS 2024
Uganda Advanced Certificate of Education
BIOLOGY
(Theory)

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of sections; **A** *and* **B**.

Answer **all** *questions in both sections.*

Write answers to section **A** *in the boxes provided and answers to section* **B** *in the spaces provided*

No *additional sheets of paper should be inserted in this booklet.*

For Examiners' Use Only			
Section	**Question**	**Marks**	**Examiner's Signature and No.**
A	**1 – 40**		
B	**41**		
	42		
	43		
	44		
	45		
	46		
Total			

SECTION A (40 MARKS)

Write the letter corresponding to the right answer in the box provided. Each question in this section carries **one** *mark.*

1. What is the function of the Golgi apparatus?

   A. To increase the area of the endoplasmic reticulum
   B. To manufacture secretory products
   C. To ingest external fluid droplets
   D. To prevent digestion of the cell by its own enzyme

2. Which of the following statements is correct concerning the dark reaction of photosynthesis?

   A. NADPH2 is necessary as the only source of energy for the reaction
   B. Carbon dioxide is the only source of oxygen to be evolved later
   C. ATP is the only source of energy for the reaction
   D. The site of the dark reaction is the stroma of the chloroplast

3. The control of protein synthesis can be looked upon as a process of transcription and translation within a particular coded message. Which of these represent the correct sequence between the coding machinery

   A. RNA- mRNA- tRNA- amino acids
   B. DNA- mRNA- rRNA- tRNA- polypeptide chain
   C. rRNA- tRNA- mRNA- polypeptide chain
   D. DNA- mRNA- rRNA- amino acids

4. The term water stress means

   A. Presence of too much water in a plant
   B. Lack of water in plant tissues
   C. The tension resulting from transpiration
   D. The effect of the pressure potential on the cell vacuole

5. All algae have

   A. Chlorophyll a
   B. Chlorophyll b
   C. Phaeophytin
   D. Phycoerythrin

6. An enzymatic reaction of the type: pyruvic acid → acetyl COA + CO2 +2H is catalysed by

   A. Condensases only
   B. Hydrolases and transferase
   C. Synthetases and dehydrogenases
   D. Dehydrogenase and decaboxylases

7. Proteins are not stored in the body. This is because they

   A. Contain an amino group which is a nitrogenous compound and is toxic to the body
   B. Contain a carboxyl group which is acidic and increases the pH of the body
   C. Are easily digested by enzymes
   D. Are quickly used up in cells

8. Fruit juices are rich in

A. Ascorbic acid
B. Retinol
C. Calciferol
D. Tocopherol

9. Phosphorylation occurs in

A. Cytoplasm
B. Mitochondria
C. Golgi bodies
D. Chloroplasts

10. The absorption of calcium ions requires vitamin

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

11. The leaves of a plant growing on the floor of a rain forest are likely to be

A. Small, thick and waxy
B. Large thin and fragile
C. Small' yellowish-green and flattened
D. Large' thick and deep green

12. Which of these biochemical conventions are not likely to occur in nature

A. Protein to glucose
B. Pyruvate to fatty acids
C. Alanine to fat
D. Fatty acids to glucose

13. The vascular bundles of the plant serve:

A. transport function only
B. transport and mechanical function
C. mechanical function only
A . transport and storage function

14. Which of these substances behaves like a monossaccharide during its chemical test?

A. Glycogen
B. Starch
C. Glucose
D. Maltose

15. The oxygen released in photosynthesis comes from

A. Carbon dioxide
B. Water
C. Chlorophyll
D. Electron transport system

16. What proportion of a parent DNA molecule is contained in each daughter molecule after replication according to the conservative hypothesis?

A. 0
B. 1/4
C. 1/2
D. ¾

17. The carbon dioxide acceptor in photosynthesis is a

A. Pentose sugar
B. Trios sugar
C. PEP
D. RuBCo

18. Phospholipids are lipids containing

A. Phosphoric acid only
B. Phosphoric acid and carbohydrate
C. Phosphoric acid and protein
D. Phosphoric acid and a nitrogenous base

19. The water potential of a cell is zero at

A. Partial plasmolysis
B. Complete plasmolysis
C. Partial turgour
D. Full turgour

20. In DNA the genetic information is represented by a codon of three

A. Deoxyribose sugars
B. Polypeptides
C. Peptides
D. Nucleotides

21. During which phase of meiosis are chiasmata formed.

A. Prophase I
B. Metaphase I
C Anaphase II
D. Metaphase II

22. In root tip cells, cell plate formation occurs during:

A. Anaphase
B. Interphase
C. Metaphase
D. Telophase

23. Which is the longest phase in the cell cycle of human liver cells

A. Anaphase
B. Cytoplasmic cleavage
C. Interphase
D. prophase

24. The formation of chiasmata is an important feature of meiotic division because it

A. Ensures that the same genetic characteristics appear in daughter cells as in parents
B. Ensures that the number of genes in the new chromosomes remain constant.
C. Provides opportunities for new genotypes to arise.
D. Prevents homologous chromosomes from pairing.

25. If one ignores the effect of crossing over, then the number of different haploid cells which could be by meiotic division of a diploid cell that contains 10 chromosomes i.e. (n=5) is

A. 32
B. 4
C. 8
D. 16

26. Which one of the following biological process does not utilize respiratory energy?

A. Absorption of mineral salts
B. Synthesis of mineral salts
C. Loss of water vapour from stomata
D. Meiosis

27. The products of light reaction of photosynthesis are:-

A. NADPH2 and ATP
B. NADPH2, oxygen and ATP
C. NADPH and oxygen
D. ATP and oxygen

28. Provision of the baby with colostrum is one way of providing it with immunity known as

A. Natural passive
B. Acquired passive
C. Natural active
D. Acquired active

29. Which one of the following cells is known for causing allergic reactions in the body of an organism?

A. Basophils
B. Monocytes
C. Eosinophils
D. lymphocytes

30. In Calvin cycle energy is required during

A. Fixation of CO_2 by ribulose biphosphate
B. Conversion of glycerate phosphate to trios phosphate
C. Conversion of Ribulose phosphate to trios phosphate
D. The activation of the enzyme ribulose biphosphate carboxylase

31. Which of the following is not an adaptation for photosynthesis in shade plants?

A. High chlorophyll content
B. low compensation point
C. thin leaves
D. thick leaves

32. Which one of the following is released during ovulation?

A. Oogonium
B. ovum
C. primary oocyte
D secondary oocyte

33. The potentiality of replication of DNA depends on:

A. Hydrogen bonds, between the bases
B. High energy bonds, between phosphate
C. Covalent bonds between bases
D. High molecular weights

34. Competitive enzyme inhibitors

A. bind permanently to the active site
B. change the shape of the active site
C. limit formation of enzyme-substrate complexes
D. lower activation energy of the reaction

35. Which of these structures contains genetic material that has telomers?

A. Bacterial cell
B. chloroplast
C. mitochondria
D. nucleus

36. Which one of the following cannot occur during hibernation of the frog?

A. Glycogenesis
B. Gluconeogenesis
C. Glucogenesis
D. Glycogenolysis.

37. 21.2% of the bases in a molecule of DNA are cytosine what percentage would be adenine?

A. 21.2%
B. 28.8%
C. 42.4%
D. 57.6%

38. In a DNA molecule, the base AGT codes for the amino acid serine. The base sequence of the anti-codon on the tRNA to which serine becomes attached is;

A. AGU
B. GAU
C. TCA
D. UCA

39. Which one of the following is not true about mitosis in plants?

A. There is formation of asters
B. No centrioles are involved
C. cell plates are formed
D. does not involve furrowing of the cytoplasm

40. The enzyme lysozyme secreted from tear glands forms deposits on contact lenses. Which of the following would best clean the deposits?

A. ethanol
B. lysosomes
C. pH buffers
D. proteases

SECTION B (60 MARKS)

Write in the spaces provided

41. (a) (i) State **three** differences between carbohydrates and lipids. *(03 marks)*

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(ii) State **three** physiological functions of carbohydrates in plant life. *(03 marks)*

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(b) Describe how lipids cause artherosclerosis *(04 marks)*

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42. (a) Describe how the C4 plants are modified to prevent photorespiration. *(03 marks)*

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(b) State the advantages of:

(i) C4 photosynthesis over C3 photosynthesis *(03 marks)*

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(ii) C3 photosynthesis over C4 photosynthesis *(02 marks)*

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(c) State the likely habitats of: *(02 marks)*

(i) C3 plants

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(ii) C4 plants

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43. (a) What is **active transport?** *(01 mark)*

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(b) How is the occurance of active transport in cells consistent with the structure of the plasma membrane? *(03 marks)*

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(c) What evidence is there to account for the facts that active transport require energy and is selective? *(03 marks)*

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(d) Summarise the events that occur in a plant cell when it achieves full turgor. *(03 marks)*

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44. (a) What do you understand by the term **DNA replication?** *(01 mark)*

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(b) Describe the structure of a DNA molecule. *(04 marks)*

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(c) Suggest any **five** evidence for DNA as a genetic material. *(05 marks)*

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45. (a) Explain the term Bohr effect. *(02 marks)*

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(b) Briefly explain the following observations;

(i) The oxygen dissociation curve of a fetus is to the left of that of the mother. *(02 marks)*

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(ii) Sickle-shaped erythrocytes are less efficient in carrying oxygen to the tissues than the normal shaped cells. *(02 marks)*

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(iii) the lumen of arteries is smaller than that of veins. *(02 marks)*

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(b) Mention any **two** blood pigments which contain iron. *(02 marks)*

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46. (a) Define the term **euploidy**. *(01 mark)*

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(b) Briefly explain why mutated genes cannot be eliminated from the populations of organisms. *(04 marks)*

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(c) Briefly explain the role of mutation towards evolution. *(04 marks)*

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(d) Mention any **two** mutagens. *(01 mark)*

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END