Name:.....Centre/Index No:...../.....

553/1
BIOLOGY
THEORY
Paper 1
JULY/AUGUST, 2023
2½ hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS JULY/AUGUST, 2023

BIOLOGY
0755362515
THEORY

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Answer ALL *questions in section* A *and* B, *plus any* TWO *questions in section* C.

Answers to section A *and B* should be written in the spaces provided strictly.

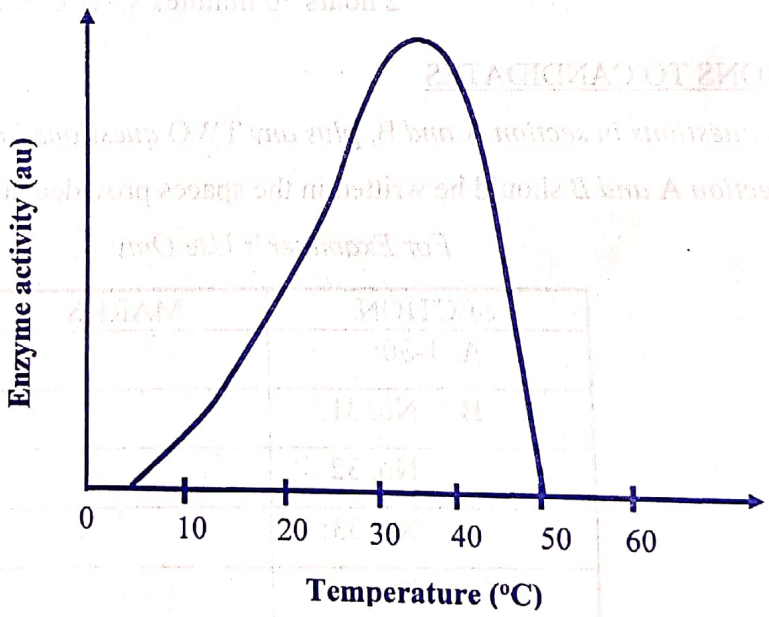
For Examiner's Use Only

SECTION	MARKS
A: 1-30:	
B No. 31:	
No. 32:	
No. 33:	
C No. :	
No:	
TOTAL	

SECTION A (30 MARKS)
ANSWER SHEET

1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

1. Which one of the following describes the function of the stigma?
   A. Supports the flower.
   B. Protects the flower bud before opening.
   C. Produces sugary nectar to attract insects.
   D. The sticky platform on to which insects deposit pollen grains from other flowers.
2. The graph below shows the effect of temperature on enzyme activity in man. At which temperature does the enzyme work fastest?



   A. 37°C
   B. 40°C
   C. 45°C
   D. 50°C

3. Which one of the following processes removes carbondioxide from the air?
   A. Respiration
   B. Combustion
   C. Fermentation
   D. Photosynthesis.

4. Which one of the following organisms can produce Nitrogen compounds from Nitrogen gas?
   A. Algae
   B. Fungi
   C. Bacteria
   D. Protozoa
5. Which one of the following hormones causes milk production by the breasts?
   A. Oxytocin
   B. Oestrogen
   C. Progesterone
   D. Follicle stimulating hormone.
6. Which one of the following cells has no nucleus?
   A. Ovum
   B. Sperm
   C. Red blood cells
   D. White blood cells
7. Which one of the following is the final breakdown product of fats?
   A. Amino acids
   B. Polypeptides
   C. Glucose and fructose
   D. Fatty acids and glycerol
8. Which animal in the table below is correctly matched with its respiratory surface?

Animal	**Type of respiratory surface**
A: Fish	Alveoli
B: Frog	Skin
C: Insect	Cell membrane
D: Amoeba	Tracheoles

9. Which one of the following produces gastric juice?
   A. Colon
   B. Liver
   C. Stomach
   D. Pancreas

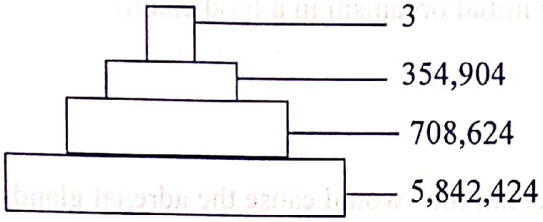
10. Which one of the following is characteristic only of arteries?
    A. Valves are present
    B. Contain red blood cells
    C. Contain deoxygenated blood
    D. Carry blood away from the heart.

11. Which one of the following comparisons of the mechanism of inhalation and exhalation is incorrect?

Inhalation	Exhalation
A. Internal intercostal muscles relax	Internal intercostal muscles contract
B. Ribs lowered in man	Ribs raised in man
C. Diaphragm flattens	Diaphragm arches upwards
D. Diaphragm contracts.	Diaphragm relaxes

12. Which one of the following responses would result from an increase in the carbon dioxide concentration in the blood of a man?
    A. Negative feedback and a faster breathing rate.
    B. Positive feedback and a faster breathing rate
    C. Negative feedback and a slower breathing rate
    D. Positive feedback and a slower breathing rate.
13. Which one of the following chemical components do carnivorous adaptations of plants mainly compensate for? Soil that has relatively low content of-
    A. Calcium
    B. Nitrogen
    C. Phosphate
    D. Potassium
14. Which one of the following describes a fruit?
    A. Fused carpel
    B. Mature ovule
    C. Mature ovary
    D. Seed plus its integuments.
15. Where in the heart will blood returning to the mammalian heart in a pulmonary vein drain first?
    A. Left atrium
    B. Right atrium,
    C. Left ventricle
    D. Right ventricle

16. Which one of the following is characteristic of an individual with type AB blood? He....
    A. produces antibodies to the B antigen.
    B. produces antibodies to the A antigen.
    C. is considered a universal blood donor.
    D. is considered a universal blood recipient.
17. Study the pyramid of numbers below and answer the question that follows.



Which of the figures below represents primary consumers?

    A. 3
    B. 354,904
    C. 708,624
    D. 5,842,424
18. What is the role of decomposers in the nitrogen cycle?
    A. Fix nitrogen into ammonia
    B. Denitrify ammonia thus returning nitrogen to the atmosphere
    C. Convert ammonia to nitrate which can then be absorbed by plants
    D. Release ammonia from organic compounds thus returning it to the soil.
19. Which of the following changes occurs only in boys at puberty?
    A. Growth of pubic hair
    B. Enlargement of the larynx
    C. Widening of the pelvic girdle
    D. Growth of hair in the armpits
20. What causes Haemophilia? A.....
    A. recessive gene carried on an autosome
    B. recessive gene carried on the X – chromosome
    C. dominant gene carried on the Y- chromosome
    D. dominant gene carried on the X-chomosome.
21. Which one of the following describes a disease which spreads world wide?
    A. Virulent
    B. Endemic
    C. Epidemic
    D. Pandemic
22. Which of the following is a dangerous immediate reaction of the body as a result of taking alcoholic drinks?
    A. Liver cells break down
    B. Blood vessels in the skin contract
    C. Less water is excreted from the kidneys
    D. Conduction of nervous impulses slows down

23. Which one of the following glands produces digestive enzymes as well as a hormone?
    A. Liver
    B. Thymus
    C. Pancreas
    D. Parathyroid
24. What is the nature of the initial organism in a food chain?
    A. Parasitic
    B. Saprophytic
    C. Herbivorous
    D. Photosynthetic
25. Which of the following conditions would cause the adrenal glands of a man to produce a hormone?
    A. Eating a fruit
    B. Hearing a song
    C. Seeing a lion
    D. Smelling a perfume
26. Which of the following describes the quill feathers fixed to the posterior border of the hands?
    A. Primaries
    B. Filoplumes
    C. Secondaries
    D. Wing coverts
27. Which one of the following is most responsible for the rise of water up a tall tree?
    A. Root pressure
    B. Turgor pressure
    C. Osmotic potential
    D. Transpiration suction
28. Funnels X, Y and Z were plugged with cotton wool at their bases and were then filled to the same level with clay, loam and Sandy Soil 310cm^3 of water was added into each of these funnels. The filtrations collected at the end of twenty-five minutes were as follows;
    X - 160cm^3, Y – 210cm^3 and Z – 260cm^3.
    Which funnel(s) contained sandy soil?
    A. Z
    B. X
    C. Y and Z
    D. X and Y
29. What is likely to happen to a plasmolysed cell if it is transferred into water and left in it for one hour? It will…
    A. not experience any change in size.
    B. shrink and the vacuole disappear altogether.
    C. lose water to the surrounding and decrease in size.
    D. absorb water from the surrounding and increase in volume.

30. In one of the methods of estimating population size of mobile animals, the following variables are used:
    (i) N = Estimated size of population
    (ii) N_1 = Total numbers of individuals in the first sample
    (iii) N_2 = Total number of individuals in the second sample
    (iv) N_3 = number of marked individuals recaptured.
    Which one of following gives the correct calculation used to get the estimate?
    A. $N = \frac{N_1 x N_2}{N_3}$

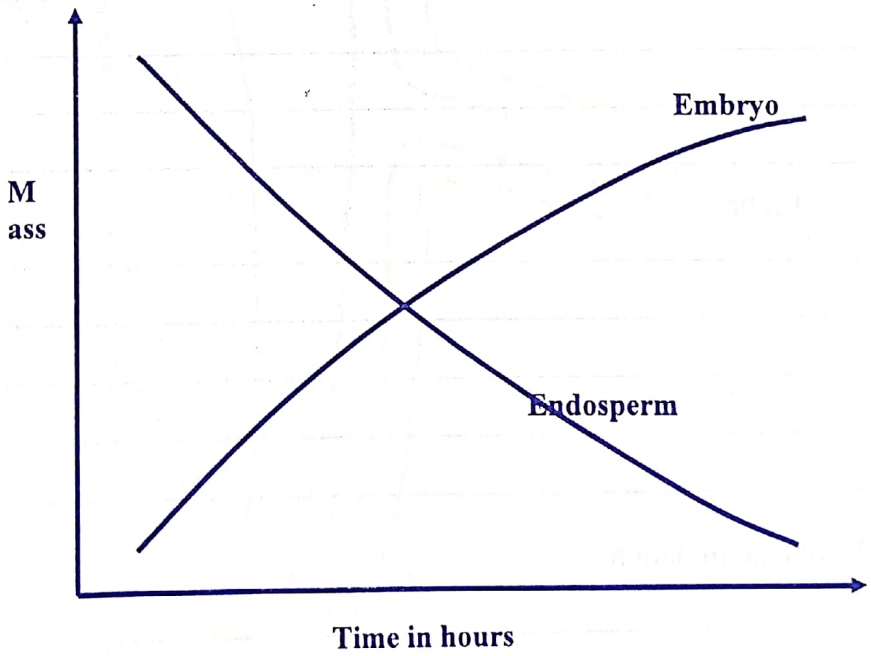
    B. $N = \frac{N_2 x N_3}{N_1}$

    C. $N = \frac{N_1 x N_3}{N_2}$

    D. $N = \frac{N_3}{N_1 x N_2}$

SECTION B: (40 marks)

31.(a) The graph below shows the relationship between dry mass of embryo and endosperm in a monocot seed during germination. Study it carefully and answer the questions that follow.



(i) Explain why the dry mass of the endosperm decreases while that of the embryo increases. (5 marks)

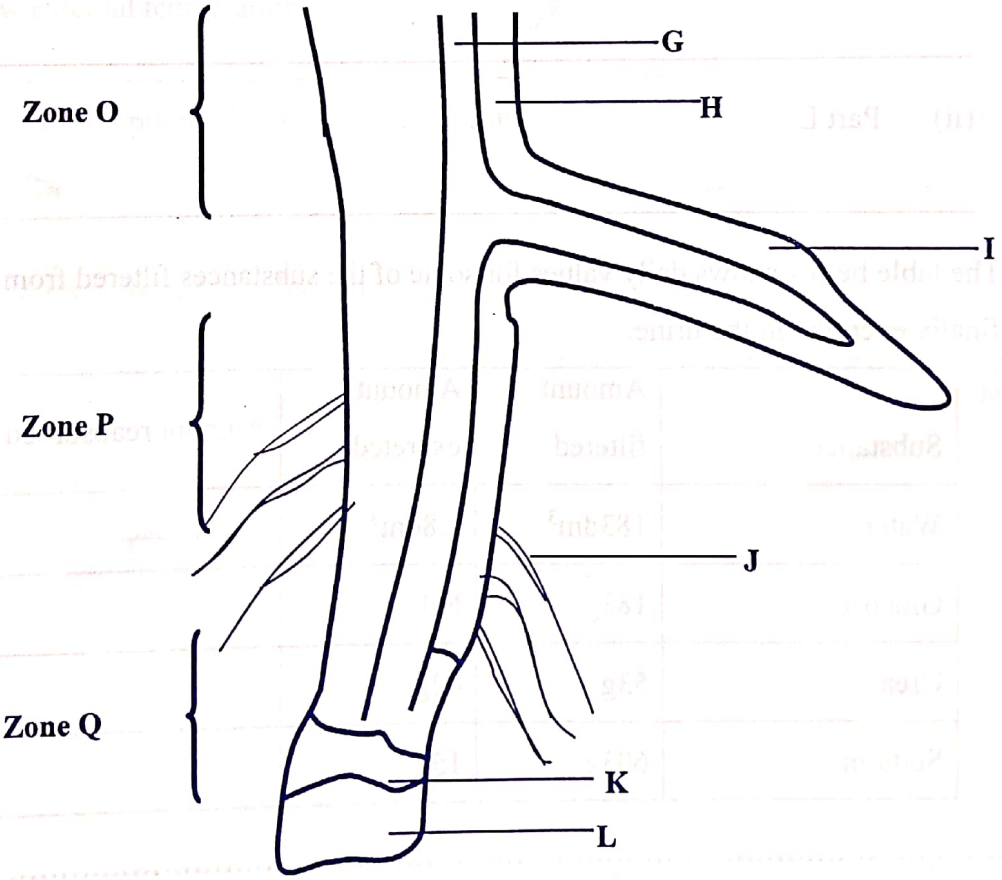
(ii) Describe the physiological activities taking place in the endosperm and the embryo.
Endosperm: (4 marks)

Embryo; (3 marks)

(b) (i) Define germination (1 mark)

(ii) Describe the different types of germination. (7 marks)

32. The figure below represents part of a root of a dicotyledonous plant. Study it very carefully and answer the questions that follow:



(a) Name parts G to L (6 marks)

G-_____

H-_____

I-_____

J-_____

K-_____

L-_____

(b) Identify the zone that gives rise to root hairs. (1 mark)

_____

(c) Identify the zone of branching (1 mark)

_____

(d) State the functions of;

(i) Part J (1 mark)

_____

(ii) Part L (1 mark)

_____

33. The table below shows daily values for some of the substances filtered from the blood and finally excreted in the urine.

Substance	Amount filtered	Amount excreted	Amount reabsorbed
Water	183dm^3	4.8dm^3	
Glucose	183g	Nil	
Urea	53g	42g	
Sodium	603g	15g	

Calcium	8g	0.5g	
Potassium	38g	5g	

(a) Complete the third column of the table to show the amount of each substance reabsorbed. (3 marks)

(b) (i) Which hormone affects the amount of water reabsorbed in the kidneys? (1 mark)

_____

(ii) Identify the process by which water is reabsorbed in the nephrons. (1 mark)

_____

(iii) Name the gland which secretes the hormone named in b(i) above. (1 mark)

_____

(c) Which of the substances in the table would be excreted in large amounts as a result of the following conditions?

(i) Low external temperature. (1 marks)

_____

(ii) Consumption of large amount of meat. (1 mark)

_____

(iii) Lack of insulin production. (1 mark)

_____

(d) State two main functions of the kidney (1 mark)

(i) _____

(ii) _____

SECTION C (30 Marks)

34. (a) What is a reflex action? (1 mark)

(b) Make a large labelled diagram to show a cross-section of the spinal cord and the arrangement of the neurons in a reflex arc. (10 marks)

(c) Give two examples of simple reflex actions and explain how they can be useful to us. (4 marks)

35. (a) (i) Define the term photosynthesis. (1 mark)

(ii) State the conditions necessary for photosynthesis. (3 marks)

(b) Describe how a dicotyledonous plant leaf is adapted to its function. (11 marks)

36. (a) Outline the functions of;

(i) arteries

(ii) veins

(iii) Capillaries (1 ½ marks)

(b) Describe how the structures of (i), (ii) and (iii) above suit those functions (7 ½ marks)

(c) Describe a double circulation in man. (6 marks)

37. (a) Briefly describe the following terms (9 marks)

(i) Competition

(ii) Predation

(iv) Parasitism

(b) Outline six ways in which the Tape worm is adapted to a parasitic mode of life. (6 marks)

 End