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



Uganda Certificate of Education

MOCK EXAMINATIONS JULY/AUGUST, 2023

BIOLOGY 0755362515 THEORY

The graph below shows the effect - I rape mine on encyme activity in man. At which

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:        | 1 8                          |
| B No. 31:       | 1                            |
| No. 32:         | and the second of the second |
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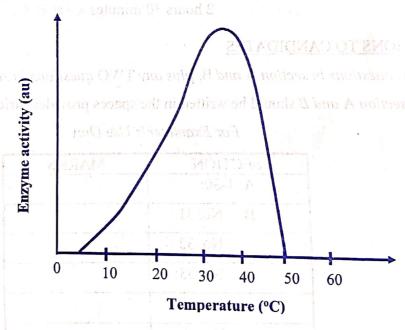
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## SECTION A (30 MARKS) ANSWER SHEET

| 1  | 11 | 1 101  | 21 | 7 1010                     |
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| 3  | 13 | The state of the s | 23 | tade,                      |
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| 9  | 19 | Premio Certificant of  | 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

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|            | · Pringer and a contract of the contract of th | C D ** 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |

| Respiration  | g processes ren             | noves carbondioxide from the air?  |
|--|-----------------------------|--|
| Combustion   |                             |  |
| Fermentation   |                             | <ol><li>Contain red blood cetts</li></ol>  |
| Photosynthesis.  |                             | <ul> <li>Contain deoxy genered blond</li> <li>Carry blood away from the bears.</li> </ul>  |
| hich one of the followin   | g organisms ca              | n produce Nitrogen compounds from N  |
| Stran Halmedal to men  |                             | s nich and of the following companion  |
| Algae  |                             |  |
| 0  | Exhalation                  | anitaledul   |
| Bacteria<br>Protozoa   | Internal inte               |  |
|  |                             | A. Internal intercestal maseles eta  |
| Ovytooin   | g hormones cau              | ises milk production by the breasts?   |
| Oxytocin Oestrogen   | Diaphraym                   | a state and all of   |
| Ocstrogen  |                             | C. Diaphragni flattens   |
| Progesterone Follicle stimulating how thich one of the following | tuaeunderr                  | D. Disphragm contracts.  |
| hich one of the following  | g cells has no n            | voleve?  |
| Ovum   | g cens nas no n             | A hich one of the following responses, w   |
| Sperm  | OHIO FESHIE GOD             | oncentration in the blood of a man?  |
| the beautiful to a   | Strain 1 The section of the | Meganic feedback and a faster broad  |
|  | Call was Sen                | Positive Icolouck and a laster break   |
| hich one of the followin   | g is the final br           | eakdown product of fats?   |
|  |                             | Positive feedback and a slower breat   |
| Polypeptides   | mponents do ea              | Which one of the following chemical co   |
| Glucose and fructose   | arively law con             | rainly compensate for? Soil that has rel   |
| . Fatty acids and glycero  | ol <sub>e</sub> and the     | unicia?  |
| hich animal in the table   | below is correc             | tly matched with its respiratory surface   |
|  | Type of respi               | ratory surface   |
| Animal •   |                             | Vince one of the following everybes as   |
| Animal A: Fish   | Alveoli Stari               | The said and a Committee of the said and the |
| F  | Alveoli Skin                | logen be of  |
| A: Fish  |                             | to the second state of the |
| A: Fish B: Frog  | Skin                        | to the second state of the |

- B. Liver
- C. Stomach
- D. Pancreas

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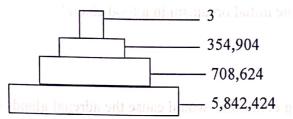
- 10. Which one of the following is characteristic only of arteries?
  - A. Valves are present
  - B. Contain red blood cells
  - C. Contain deoxygenated blood
  - D. Carry blood away from the heart.
- 11. Which one of the following comparisons of the mechanism of inhalation and exhalation is incorrect?

| 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 trigger at it driw bedaten vitremos al
  - 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

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- 16. Which one of the following is characteristic of an individual with type AB blood? He....
  - A. produces antibodies to the B antigen, along almala am wellow and to any and W
  - 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 real of the following describes the quilt fembers fixed to the lost gainworld and to the 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
- - 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

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|---|--|
|   |  |
| 23. Which one of the following of                 | glands produces digestive enzymes as well as a hormone?  |
| A. Liver  | glands produces digestive only   |
| B. Thymus   |  |
| C. Pancreas                                       |  |
| D. Parathyroid                                    | ed dowers his scale remains of a large entitle of the  |
| 24. What is the nature of the initial             | ial organism in a food chain?  |
| A. Parasitic                                      | iai organishi in a 100a onam   |
| B. Saprophytic                                    |  |
| C. Herbivorous                                    |  |
| D. Photosynthetic                                 |  |
| 25. Which of the following cond                   | itions would cause the adrenal glands of a man to produce a  |
| 1 0   |  |
| A. Eating a fruit                                 | archer rayming go bed on it vested that the strength of  |
| B. Hearing a song                                 |  |
| C. Seeing a lion                                  |  |
| D. Smelling a perfume                             |  |
|   | ribes the quill feathers fixed to the posterior border of the  |
|   | sta ga waishi aga ne masagimusuk fo a 💢 💢 💢 💢 💢 💢 💢  |
| A. Primaries                                      |  |
| B. Filoplumes                                     |  |
| C. Secondaries                                    | as of reduce for a small dance of the first of   |
| D. Wing coverts                                   | e and all management and a contract that I do the  |
| 27. Which one of the following i                  | s most responsible for the rise of water up a tall tree?   |
| A. Root pressure                                  |  |
| B. Turgor pressure                                |  |
| C. Osmotic potential                              | en kar en en en endelig trafog aftito de en en en en en  |
| D. Transpiration suction                          | endende in the second of the s |
| 28. Funnels X, Y and Z were plu                   | gged with cotton wool at their bases and were then filled to th  |
|   | nd Sandy Soil 310cm <sup>3</sup> of water was added into each of these   |
|   | cted at the end of twenty-five minutes were as follows;  |
| $X - 160 \text{cm}^3$ , $Y - 210 \text{cm}^3$ and | $Z - 260 \text{cm}^3$ .  |
| Which funnel(s) contained sa                      | indy soil?   |
| A. Z James Lyrow Shrangell                        | Dudley southers on emitted enhanced in the control of the control  |
| 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                                 | life at the first suppression of the second  |
| A not experience any change                       | e 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.

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- 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)  $N_1 = \text{Total numbers of individuals in the first sample}$
  - (iii)  $N_2 = \text{Total number of individuals in the second sample}$
  - (iv) N<sub>3</sub> = 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. 
$$N = \frac{N_2 x N_3}{N_1}$$

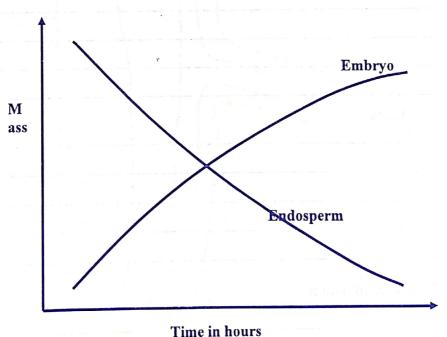
C. 
$$N = \frac{N_1 x N_3}{N_2}$$

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.



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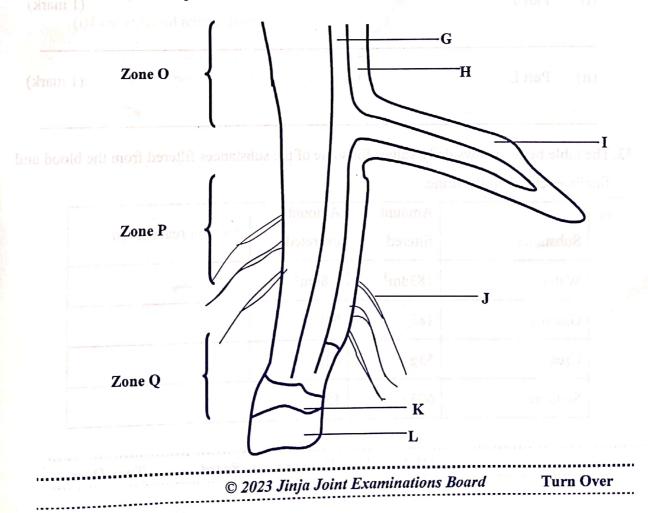
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|                                |  |  |                             |
|                                |  | #1 <sup>4</sup> _2 _ 1   |                             |
|                                |  |  |                             |
| -                              |  |  |                             |
| -                              | S 5 1 6 10   |  |                             |
|                                | A SOLD PROPERTY  | 70.0   |                             |
|                                |  |  |                             |
| (ii)                           | Describe the physiological activities taking plac<br>Endosperm: (2) (2) (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4   |  | (4 mark                     |
|                                | •  |  |                             |
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| abn <del>ā i</del><br>stiens r |  | THE PARTY OF THE P | 2011 B<br>2011 B<br>2011(a) |
| andos<br>stiens i              |  | THE PARTY OF THE P | eattal                      |
| endos<br>stiena i              |  | geisch dusige  | 20(f E)<br>20(f E)          |
| endos<br>stiens t              |  | geisch dusige  | 20(F B<br>90(G)             |
| endos<br>efens (               |  | geisch dusige  |                             |
| endos<br>efims (               |  | geisch dusige  |                             |
| endos<br>efens (               | Capitalos, Study it carefully and apswer the had   | and the second   |                             |
| endos<br>efens (               | Capitalos, Study it carefully and apswer the had   | and the second   |                             |
| endos                          | Capitalos, Study it carefully and apswer the had   | and the second   | (3 marks                    |
| endos                          | Capitalos, Study it carefully and apswer the had   | and the second   |                             |
| endos                          | Capitalos, Study it carefully and apswer the had   | and the second   |                             |
| i annits                       | Embryo;  | and the second   | (3 marks                    |
| i annits                       | Capitalos, Study it carefully and apswer the had   | and the second   | (3 marks                    |
| i annits                       | Embryo;  | and the second   | (3 marks                    |
| i annits                       | Embryo;  | and the second   |                             |



| (ii) marks) | Describe the different types of germination. | Jest i) ztracy anatol (7 marks |
|-------------|--|--------------------------------|
|             |  | -11                            |
|             |  | 7000                           |
|             |  |                                |
|             |  | K                              |
|             |  |                                |
| (duam f)    | ves rise to root hairs.                      | (n) Identify the zone that gi  |
| _           |  |                                |
| mit Am      |  | and the second                 |
| (1 mark)    | gmun   | nid to oness oth gambar (2)    |

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   |  |                         | Describe the differu   | (6 mark               |
|---|--|-------------------------|--|-----------------------|
| G   |  |                         |  |                       |
| Н   |  |                         |  |                       |
| I   |  |                         |  |                       |
| J   |  |                         |  |                       |
| K   |  |                         |  |                       |
| (b) Identify the zone the   | hat gives rise to re   | oot hairs.              |  | (1 mark               |
| (c) Identify the zone of  | of branching   |                         |  | (1 mark)              |
| armen of the second of the second   | All the second s |                         | the second secon |                       |
| (d) State the functions  (i) Part J   | of;  |                         | suswer the questions i   |                       |
|   | of;  |                         |  | (1 mark)              |
| (ii) Part J  (ii) Part L  The table below show finally excreted in the                  | ws daily values for e urine.  Amount   | or some of the su       | ir enon-roup out rowens  | (1 mark) ——— (1 mark) |
| (i) Part J  (ii) Part L  The table below show   | ws daily values for e urine.   | or some of the su       | bstances filtered from the   | (1 mark) ——— (1 mark) |
| (ii) Part J  (ii) Part L  The table below show finally excreted in the Substance        | ws daily values for e urine.  Amount filtered  | Amount excreted         | bstances filtered from the   | (1 mark) ——— (1 mark) |
| (ii) Part J  (ii) Part L  The table below show finally excreted in the Substance  Water | ws daily values for e urine.  Amount filtered  183dm³  | Amount excreted  4.8dm³ | bstances filtered from the   | (1 mark) ——— (1 mark) |

| Calcium   | 8g  | 0.5g        | (a) What is a reflex action |
|-----------|-----|-------------|-----------------------------|
| Potassium | 38g | 5g (101196) | beligher agent a wigif of   |

|         |  | (3 mark      |
|---------|--|--------------|
| (i) Wh  | nich hormone affects the amount of water reabsorbed in the kidneys?  |              |
| (ii)    |  | (1 mark      |
| (iii)   | Name the gland which secretes the hormone named in b(i) above.   | (1 mark      |
|         | h of the substances in the table would be excreted in large amounts as a r   | esult of the |
|         | wing conditions?   |              |
| 101     | wing conditions.  we external temperature.  where the following terms are the following terms are the following terms. | (1 marl      |
| (ii)    | Consumption of large amount of meat.   | (1 mar       |
| (iii)   | Lack of insulin production.  | (1 marl      |
| ) State | two main functions of the kidney   | (1 mar       |
| (i)     |  |              |
| (ii)    |  |              |
|         |  |              |
|         |  |              |
|         |  |              |



# SECTION C (30 Marks)

| 34. (a) What is a reflex action?   |                              | (1 mark)                     |
|--|------------------------------|------------------------------|
| (b) Make a large labelled diagram to s                                     | show a cross-section of the  | ne spinal cord and the       |
| arrangement of the neurons in a refl                                       | lex arc.                     | (10 marks)                   |
| (c) Give two examples of simple refle                                      | x actions and explain ho     | w they can be useful to us.  |
|  |                              | (4 marks)                    |
| 35. (a) (i) Define the term photosynthesis.                                | y, in accome alter to        | (1 mark)                     |
| (ii) State the conditions necessary f                                      | for photosynthesis.          | (3 marks)                    |
| (b) Describe how a dicotyledonous pla<br>36. (a) Outline the functions of; | ant leaf is adapted to its f | function. (11 marks)         |
| (ii) veins   |                              |                              |
| (iii) Capillaries  |                              | (1 ½ marks)                  |
| (b) Describe how the structures of (i), (ii)                               | and (iii) above suit thos    | e functions (7 ½ marks)      |
| (c) Describe a double circulation in man.                                  |                              | (6 marks)                    |
| 37. (a) Briefly describe the following terms                               | S 7291 200                   | (9 marks)                    |
| (i) Competition  |                              |                              |
| (ii) Predation   |                              |                              |
| (iv) Parasitism  |                              |                              |
| (b) Outline six ways in which the Tape w                                   | orm is adapted to a paras    | sitic mode of life.(6 marks) |
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|  |                              | วามราชา                      |
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