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553/1

**BIOLOGY**

**PAPER 1**

JULY/AUGUST 2016

2HOURS 30 MIN

WESTERN JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

**BIOLOGY**

**PAPER 1**

2HOURS 30 MINUTES

**INSTRUCTIONS TO CANDIDATES:**

* This paper consists of sections A, B and C
* Answer all questions in sections A and B, and **two** questions in section C.
* Write the answers to section A in the boxes provided, answers to section B in the spaces provided, and answers to section C on the answer sheets provided.

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| --- | --- | --- |
| **SECTION** | **MARKS** | **Examiner’s sign.** |
| A: |  |  |
| B: No: 31 |  |  |
| No: 32 |  |  |
| No: 33 |  |  |
|  |  |  |
| C: No: |  |  |
| No: |  |  |
| **Total** |  |  |

**SECTION A (30 MARKS)**

**Attempt all questions in this section by writing in the box provided, the letter**

**representing the most correct answer.**

1**.** Leaf tendrils are modifications of leaves for:

A. Photosynthesis B. Transpiration C. Strength D. Support

2. A person’s diet consists of more proteins than is needed for growth and repair. This causes increased production of:

A. Sweat B. Lactic acid C. Carbondioxide D. Urea

3. Which of the following components of feaces is an excretory product?

A. Bacteria B. Bile pigments C. Cellulose and mucus D. Undigested food

4. Which of the following is an energy rich carbohydrate stored in large quantities in the cytoplasm of liver and muscle cells?

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

5. Which one of the following equations represents anaerobic respiration in plants?

A. Glucose Carbondioxide and water

B. Glucose Carbondioxide + alcohol + energy

C. Glucose water + alcohol + energy

D. Glucose Carbondioxide + energy

6. Which one of the following is a correct difference between sensory and motor neurons?

|  |  |
| --- | --- |
| MOTOR NEURONS | SENSORY NEURONS |
| A. Carry impulses from receptors to the central nervous system | Carry impulses from the central nervous system to effectors |
| B. Cell body on the side of the axon | Cell body at the end of the axon |
| C. Has long axon | Has short axon |
| D. Cell body in the central nervous system | Cell body outside the central nervous system |

7. Which one of the following is a taxonomic class?

A. Annelida B. Arthropoda C. Arachnida D. Platyhelminthes

8. When testing for non-reducing sugar in a solution, hydrochloric acid is added to the solution in order to:

A. Provide a suitable PH B. Kill any bacteria in the solution

C. Hydrolyze the non – reducing sugar D. Catalyse the reaction

9. Which one of the following is the correct sequence of stages in cell division, after interphase?

A. Metaphase, Anaphase, Prophase and Telophase

B. Prophase, Metaphase, Anaphase and Telophase

C. Anaphase, Metaphase, Telophase and Prophase

D. Telophase, Anaphase, Metaphase and Prophase

10. An individual deficient in anti-diuretic hormone is likely to produce.

A. Vast quantities of dilute urine B. Urine containing glucose

C. Little concentrated urine D. Urine containing proteins

11. The role of the luteinising hormone is to:

A. Cause ovulation B. Thicken the uterine wall

C. Cause development of the graafian follicle D. Maintain pregnancy.

12. Digestion of proteins in mammals starts in the

A. Stomach B. Mouth C. Duodenum D. Ileum

13. When observed under a hand lens of magnifying power X15, the image of a hair in the nasal cavity appears 3mm long. What is the actual length of this hair?

A. 0.2mm B. 0.5mm C. 5mm D. 45mm

14. Which of the following characteristics of respiratory surfaces is true of humans but not of insects?

A. Highly vascularized B. Large surface area

C. Moist lining D. Thin walled.

15. Which of the following conditions does not arise from deficiency in diet?

A. Kwashiorkor B. Marasmus

C. Sickle cell anaemia D. Night blindness

16. The functional unit of a kidney is called a

A. Cortex B. Nephron C. Medulla D. Nephridium

17. Sound receptors in the human ear are situated in the:

A. Utricle B. Saccule C. Cochlea D. Semi- circular canal

18. Which one of the following vessels contains blood with the highest amount of carbon dioxide?

A. pulmonary vein B. Coronary vein C. Pulmonary artery D. Aorta

19. Which one of the following structures is an adaptation that makes reptiles to stay on land?

A. Scales on the body B. Possession of lungs

C. Elongated body D. Possession of two pairs of limbs

20. Which of the following hormones control carbohydrate metabolism?

A. Insulin and Glucogon B. Vasopressin and insulin

C. Insulin and oxytocin D. Prolactin and oxytocin

21. The following are features of lower plants

(i). Produce by spores (ii). Lack vascular tissues

(iii). Grow in damp places (iv). Have simple stems and leaves

A. (i) and (iv) B. (i) and (iii). C. (ii) and (iii) D. (iii) and (iv)

22. Individuals with blood group AB are universal recipients because they have?

A. Both antigens and antibodies B. No antibodies

C. No antigens D. Antibodies a and b

23. Which of the following is the main growth stage of a butterfly?

A. Chrysalis B. Caterpillar C. Larva D. Egg

24. The human embryo normally develops in the

A. Ovary B. Oviduct C. Uterus D. Placenta

25. Mucor undergoes sexual reproduction by use of:

A. Spores B. Pollen grains C. Zygospores D. Zoospores

26. The major function of the choroid in the eye is to:

A. Focus light on the retina B. Supply nutrients to the eye

C. Cause accommodation D. Control the amount of light entering the eye

27. When radial muscles of the iris contract:

A. The pupil becomes smaller B. Suspensory ligaments become tight

C. The lens becomes thin D. The eye ball shortens

28. People who travel on an open lorry on a cold misty morning are likely to experience:

A. Vaso- constriction B. Vasodilation C. Palpitation D. Perspiration

29. At what stage of mitosis do chromosomes arrange themselves at the equator?

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

30. Albinism is caused by a double recessive gene aa. If a carrier Aa marries an albino, what percentage of their offspring will be albino?

A. 25% B. 50% C. 75% D. 100%

**SECTION B: (40MARKS)**

**Answer all questions in this section.**

**Answers must be written in the spaces provided**.

31. **Graph (a)** below shows the changes in blood glucose of an individual after a meal, while **graph (b)** shows the effect of injecting 1 unit of insulin into a person, and the concentration of glucose in the blood measured at regular intervals. Study the two graphs and answer the questions that follow

0

C

A

D

B

200

150

100

50

1.00pm

2.00pm

3.00pm

4.00pm

Meal containing sugar eaten at 1.00pm

Blood glucose /mg per 100cm3

Time/hrs

Graph (a)

(b) Graph (b)

Blood glucose

Time (minutes)

Blood glucose/mg per 100cm3

Insulin injected

110

100

40

80

90

70

60

50

5

0

10

15

20

25

30

35

40

45

50

(a)(i). Explain the shape of the graph in (a) between (i) A and B **2mks**

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(ii). B and C **2mks**

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(iii). C and D **2mks**

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(b). Explain the shape of the graph (b).

(i). Within the first 10minutes after insulin injection **2mks**

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(ii). Between 15 and 20minutes **2mks**

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(iii). Between 20 and 50minutes **3mks**

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C (i). Name the organ in the human body that secrets insulin **1mk**

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(ii). What happens if the organ named in c (i) is defected and does not produce

insulin? **2mks**

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(iii). Name another hormone secreted by the organ named above and describe its

effect on the metabolism of carbohydrates **2mks**

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(d). Briefly explain the effect of extremes of glucose in the blood **2mks**

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32(a). Explain how each of the following parts of the skin regulates body temperature when environmental temperature is high

(i). Hairs **3½mks**

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(ii). Sweat glands **3½mks**

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(b). Explain why it is necessary to maintain a constant body temperature **3mks**

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33(a). The table below shows the effect of wind, still air and stomatal opening on the

rate of transpiration of a plant in miligrams of water lost per hour perdm2. Study the table and answer the questions that follow.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Stomatal opening (NM) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Wind | 40 | 63 | 74 | 86 | 94 | 110 | 124 |
| Still air | 0 | 6 | 12 | 19 | 23 | 27 | 30 |

a(i). Compare the rates of transpiration in windy and still air conditions **3mks**

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(ii). Explain your observation **3mks**

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(b). Explain the effect of stomatal opening on the rate of transpiration **2½mks**

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(c). Name three other factors that affect the rate of transpiration **1½mks**

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**SECTION C (30MARKS)**

**Answer two questions from this section.**

**Answers should be written on the answer sheets provided**

34(a). What is the difference between a hormone and an enzyme? **3mks**

(b). Explain the effect of light from one direction on the shoot of a coleoptile **10mks**

(c). What is the adaptive significance of the response in 34(b) above? **2mks**

35(a). What is meiosis and where does it occur in plants and animals? **4mks**

(b). What is the relevance of meiosis in reproduction? **3mks**

(c). In a breeding experiment, plants which were homozygous for white flowers were

crossed with those homozygous for red flowers. The resultant F1 generation all

had red flowers

(i). Explain the absence of white flowers in the F1 generation **3mks**

(ii). Using genetic symbols, show the results in the F2 generation after selfing the F1 generation **5mks**

36(a). Distinguish between an endoskeleton and exoskeleton **2mks**

(b). Describe the adaptations of a finned fish to locomotion in water **6mks**

(c). Describe the ways in which plants obtain support **7mks**

37(a). Describe the activities of digestion which occur in each of the following parts of

the alimentary canal:

(i). Stomach **4mks**

(ii). Ileum **6mks**

(b). How is the ileum adapted to food absorption? **5mks**

**END**