NAME:..... CENTRE/ INDEX No.....

SCHOOL..... SIGNATURE:.....

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2019
$2^{1}/_{2}$hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of* ***three*** *sections;* **A, B** *and* **C.**
- *Answer* **all** *questions in sections* **A** *and* **B,** *and any* **two** *questions from section* **C.**
- *Any additional questions answered will not be marked.*
- *Answers to section* **A** *should be written in the boxes provided, on the right side.*
- *Answers to section* **B** *should be written in the spaces provided.*
- *Answers to section* **C** *should be written in the answer booklet/sheets provided.*

For Examiner's use only			
Section		**Marks**	**Examiner's Initials & No.**
A			
B	**No. 31**		
	No. 32		
	No. 33		
C	**No.**		
	No.		
Total			

Turn Over

SECTION B (30 MARKS)

Answer **all** questions in this section.

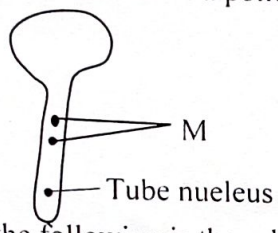
Write the letter representing the most correct answer to each question in the box provided.

1. The following is a list of organisms labeled 1 to 4.
   1. Amoeba
   2. Moss plant
   3. Bread mould
   4. A bacterium

   Which of these organisms possess a nuclear membrane?
   A. 1, 2 and 3
   B. 4 only
   C. 3 and 4
   D. 1, 2 and 4.

2. Which one of the following types of joints allows slight movement?
   A. Movable joint
   B. Fixed joint
   C. Gliding joint
   D. Synovial joint

3. The diagram below shows a pollen tube as it develops down the style.



   Which of the following is the role played by structures labeled M?
   A. One male nucleus fuses with the functional egg to form diploid nucleus
   B. They fuse together to form a diploid cell.
   C. They fuse with a tube nucleus.
   D. One fuses with a tube nucleus and the other with a functional egg.

4. Drug addicts are prone to HIV infection because;
   A. They take in much toxic drugs which weaken their bodies.
   B. They lose self-control and have poor judgment hence they cannot protect themselves
   C. They lose body balance and so can easily fall off.
   D. They take in unprocessed drugs which weaken their bodies.

5. Which of the following best explains why water logging in soil can cause death of some plants? It
   A. reduces oxygen in the soil hence plants die due to lack of enough oxygen.
   B. deprives nutrients since nutrients move to the deeper layers.
   C. has low pH which does not favor plant growth.
   D. causes rotting of plant roots.

6. An organism is said to have adapted to its environment when it
   A. has characteristics which enables it to live in that environment
   B. is highly specialized to perform some functions.
   C. can change the environment to suit its life style.
   D. can live in different habitants at the same time.

7. A rhinoceros in a national park was found to be infected with ticks. Which of the following is the trophic level occupied by the tick?
   A. Tertiary consumer
   B. Primary consumer
   C. Secondary consumer
   D. Producer

8. Which of the following cells is modified for production of cartilage?
   A. Chondroblasts
   B. Osteoblasts
   C. Nematoblasts
   D. Nerve cells

9. The name given to the type of placentation where placenta and seeds are located in the middle of the fruit is
   A. Parietal placentation
   B. Axile placentation
   C. Free central placentation
   D. Marginal placentation

10. Which one of the following nerve endings perceives the stimulus of touch?
   A. Free central nerve endings
   B. Meissner's corpuscles
   C. Pacinian corpuscles
   D. Hair plexus

11. Which blood vessels transports blood with the highest concentration of urea?
   A. Renal artery
   B. Hepatic portal vein
   C. Hepatic artery
   D. Renal vein

12. Which one of the following is a long term adaptation of mammals to low temperature environment?
   A. Raising of hair.
   B. Increase in metabolic rate.
   C. Deposition of fats under the skin.
   D. Reduction of blood flow to the skin.

13. A mixture of yeast and glucose is dissolved in water and left to stand at a temperature of (35-40°C) for some time. Which one of the following is likely to be observed?
   A. Bubbles of a gas which relight a glowing splint.
   B. Bubbles of a gas that turned lime water milky.
   C. Heat generated.
   D. Mixture turned deep blue.

14. The following events results into air being expelled out of the mammalian lungs, EXCEPT;
   A. External intercostal muscles relax
   B. Diaphragm becomes dome shaped
   C. Internal intercostal muscles relax
   D. Thoracic volume increases

15. Which one of the following is an example of tactic response?
   A. Rolling up of leaves on a sunny day.
   B. Withdrawal of blow fly larvae from light.
   C. Withdrawal of a hand from a hot object.
   D. Bending of a plant shoot towards light.

16. Six fingers in man are controlled by a sex-linked recessive gene. If a normal women marries a six-fingered man, which of the children will have six fingers?
   A. All the sons.
   B. All daughters.
   C. None of the children.
   D. Half number of boys and girls.

17. Active transport occurs in the following structures except?
A. Kidney tubules
B. Xylem vessels
C. Phloem sieve tubes
D. Ileum villi

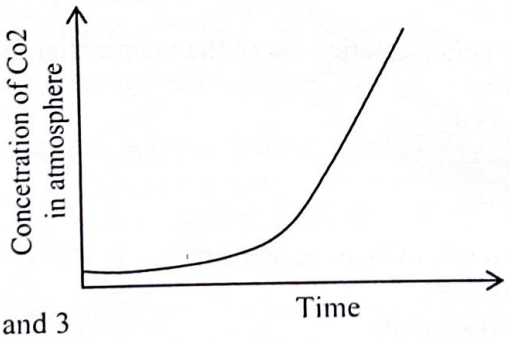
18. A palisade cell and a nerve cell are observed under a light microscope. The palisade cell differs from nerve cell by having.
A. cell membrane and dendrites.
B. cytoplasm and Dendron.
C. nucleus and axon.
D. chloroplasts and cell wall.

19. The table below shows the conditions in four test tubes containing equal amounts of starch and salivary amylase. In which test tube is the starch broken down fastest?

	PH	Temperature °C
A	2	27
B	2	37
C	7	27
D	7	37

20. The following statements are about some hormone in the human body.
V causes changes in the ovaries during the menstrual cycle
W promotes the development of stronger muscles.
X causes the voice to deepen at puberty
Y produced by the pancreas
Which statements are correct for testosterone?
A. V and W
B. V and Y
C. W and X
D. X and Y

21. Three human activities are listed
1. Burning fossil fuels
2. Deforestation
3. Over using fertilizers
Which activities can cause the changes shown in the graph?



A. 1, 2 and 3
B. 1 and 2 only
C. 1 only
D. 2 and 3 only

22. Which one of the following is responsible for the decrease in dry weight of a seed during germination?
A. The seed loses more water than it absorbs.
B. Soluble food materials are converted to starch.
C. Stored food is used up.
D. Soluble food materials are lost into the soil.

23. If a father is heterozygous for blood group A and mother is AB, then the possible number of genotypes of the off springs are _____
A. 2
B. 3
C. 4
D. 6

24. Which of the following always increases during the development of an organism?
A. Cell number
B. Complexity
C. Dry mass
D. Volume of cytoplasm

25. The success of the mosquito in spreading pathogens may be attributed to presence of
A. Wings and claws
B. Legs and claws
C. Proboscis and wings
D. Proboscis and claws

26. Which one of the following explains why digestion of starch does not occur in the human stomach?
A. Absence of starch digesting enzymes
B. Low pH for starch digesting enzymes
C. High pH for starch digesting enzymes
D. Absence of bile salts that emulsify starch.

27. Termites successfully obtain maximum nutrients value from wood mainly because they.
A. ingest only microscopic pieces
B. possess strong mandibles
C. possess a long digestive tract
D. host the microorganisms which secrete cellulase

28. Which one of the following branches of biology would you recommend for a trainee preparing to become a game ranger to study?
A. Physiology
B. Ethology
C. Biochemistry
D. Entomology

29. Which one of the following organs is supplied and drained by veins?
A. Stomach
B. Kidney
C. Liver
D. Pancrease

30. Which of the following floral modifications is a means of promoting self-pollination?
A. Protandry
B. Protogyny
C. Homogamy
D. Bright coloured petals

SECTION B

Answer **all** questions in his section.

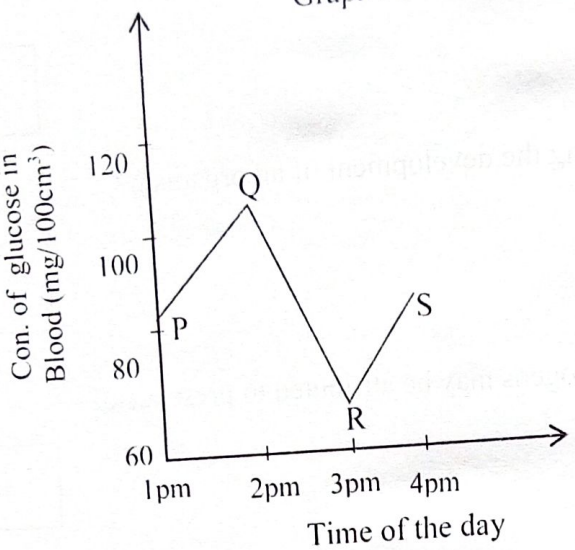
All answers **must** be written in the spaces provided.

31. Graph A shows the changes in the blood glucose of non- diabetic person after a meal while graph B shows the effect of injecting one unit of a certain hormone X in a diabetic person on the concentration of glucose in the blood measured at regular intervals.

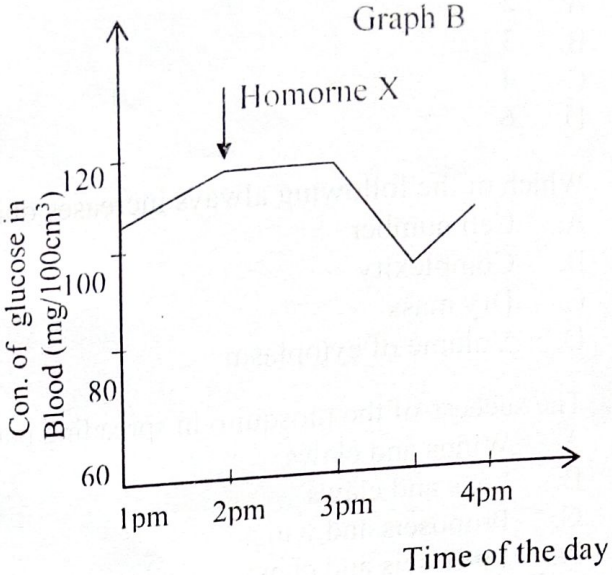
Turn Over

Study the two graphs and answer the following questions.

Graph A



Graph B



a) Explain the shape of the graph A between points; (2marks)

i) P and Q

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ii) Q and R (2marks)

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iii) R and S (2marks)

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b) Suggest the name of the hormone X. (1mark)

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c) Explain the shape of graph B between;

i) 2:30pm to 3pm after injecting hormone X. (2 marks)

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ii) 3:00pm and 3:30pm (2 marks)

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iii) 3:30pm and 4:00pm (2 marks)

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d) i) Name the organ from which hormone X was extracted. (1mark)

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ii) What would happen to an individual whose organ you named above in d (i) was defective and would not produce hormone X? (2 marks)

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iii) Name one other hormone which is produced by the organ you named above in d i) and describe its effect on carbohydrate metabolism. (2 marks)

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e) Briefly explain the effects of the extremes of glucose levels in blood. (2 marks)

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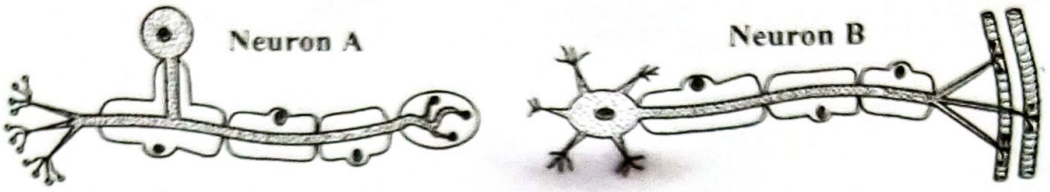
32. Figure 1, below shows two different neurones.

Fig. 1



(a) (i) Identify the type of neurone; (2 marks)

A.....

B.....

(ii) State three structural differences between neurone A and neurone B. (3 marks)

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(b) A bare footed student steps on a sharp nail and jumps away in pain.

(i) Give the name of this action. (1 mark)

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(ii) Describe the process that resulted into the student's action in (b) above. (4 marks)

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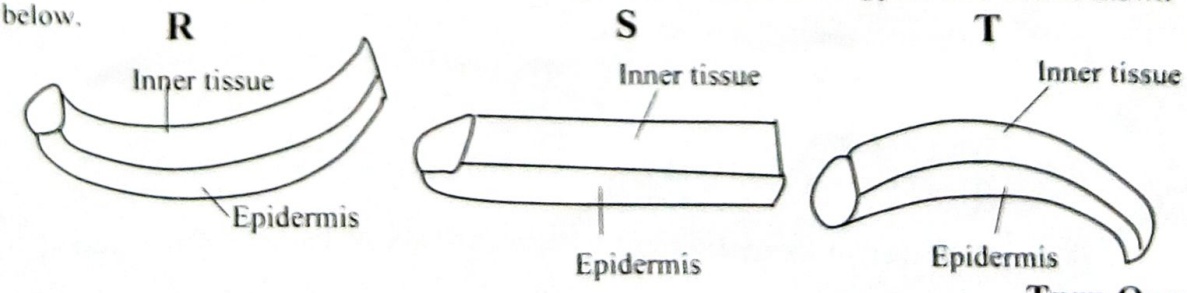
33. Equal pieces of leaf stalks were cut to 6cm in length. They were split longitudinally into two halves. Three pieces of the cut leaf stalks were placed in each of the three petri-dishes. Different concentrations of sugar solutions were put into each of the petri-dishes and the petri-dishes were covered for 15 minutes.

After wards leaf stalks were removed from the petri-dishes and their appearance was as shown below.



Turn Over

(a) Identify the strength of the sugar solutions in the petri dishes, in comparison to the fluid in the plant tissues in R, S and T. (3 marks)

R.....

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S.....

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T.....

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(b) Explain why it was necessary to cover all the three petri-dishes during the experiment. (1 mark)

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(c) Explain the difference between the results observed in the stalks in R and T. (6 marks)

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SECTION C

Answer any **two** questions from this section.

Answers to these questions **must** be written in the answer booklets/sheets provided.

34. (a) Describe the mechanism of gaseous exchange in a cockroach. (10 marks)
(b) Outline the adaptations of the trachea system for gaseous exchange. (5 marks)

35. (a) What is parasitism? (2 marks)
(b) Give three effects of Ecto-parasites on their hosts. (3 marks)
(c) Describe how a tapeworm is adapted to the parasitic mode of life. (10 marks)

36. (a) Describe what is meant by fertile soil. (5 marks)
(b) How are plants involved in soil conservation? (10 marks)

37. (a) What is photosynthesis? (2 marks)
(b) Describe an experiment to show that sun light is necessary for photosynthesis. (8 marks)
(c) Describe how leaves are adapted to absorption of sunlight energy. (5 marks)

END