Name: ……..……. Centre/Index No……

Signature ……...……..

553/1
BIOLOGY
(Theory)
Paper 1
2½ hours

STANDARD HIGH SCHOOL ZZANA

MID TERM ONE EXAMINATIONS 2020

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 Section* **A** *and* **B** *plus only* **two** *questions in Section* **C**.

Write the answers for section **A** *in the boxes provided, and* **confirm** *the answers in the answer grid provided at the end of the section. Write the answers for section* **B** *in the spaces provided.*

Answers for section **C** *should be written on the answer sheets provided.*

Drawings and illustrations are to be made neatly using a sharp HB pencil.

For Examiners' use only		
Section	**Score**	**Examiner's initials**
A		
B : No. 31		
No. 32		
No. 33		
C: No.		
No.		
Total		

Turn Over

SECTION A: (30 marks)

1. Which one of the following arteries carries oxygenated blood around the heart?

   A. Coronary artery.

   B. Aorta.

   C. Pulmonary artery.

   D. Hepatic artery.

2. The graph below shows variation of dry weight of a seedling with time, study it and use it to answer the question.

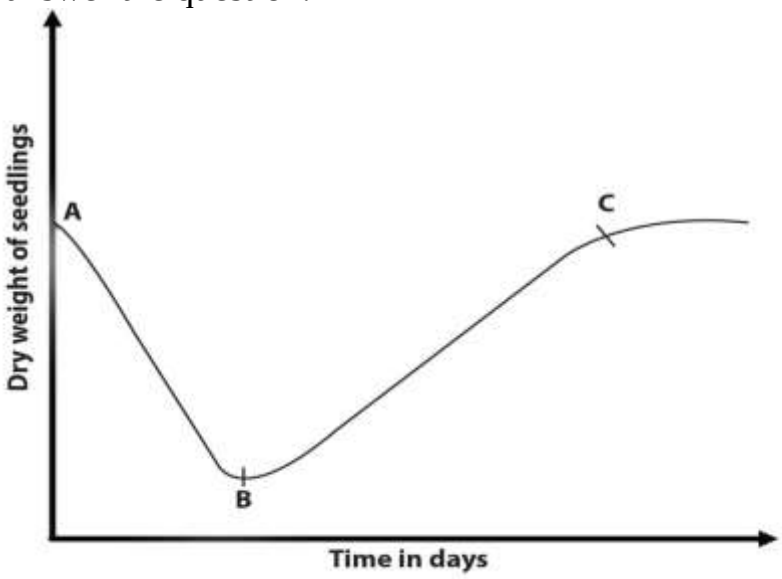

Figure 1

   The best explanation for the trend between **A** and **B** is;

   A. slightly decrease, because the seedling is partly eaten by soil organisms.

   B. rapid decrease because the stored food is oxidized to release energy for the embryo.

   C. slight increase because the seedling absorbs water during germination.

   D. rapid increase: because the seedling carries out photosynthesis and makes organic compounds.

3. Which one of the following can be a result of non uniform distribution of auxin in a plant near the growing tips?

   A. Flowering and fruit formation.

   B. Geotropism and phototropism.

   C. Nastic movement and taxis.

   D. Thigmotropism and stomata opening.

4. An internal section of a leaf was observed and the cells were found to have irregular shape, loosely packed and contained few chloroplasts, the cells are most likely to be

A. spongy.

B. epidermal.

C. palisade.

D. guard.

5. A specimen was viewed under a microscope using an objective labelled *X4* and an eye piece labelled *X10*. The final magnification of the specimen was

A. *X10*.

B. *X5*.

C. *X40*.

D. *X14*.

6. Figure below shows a transverse section of dicotyledonous plant.

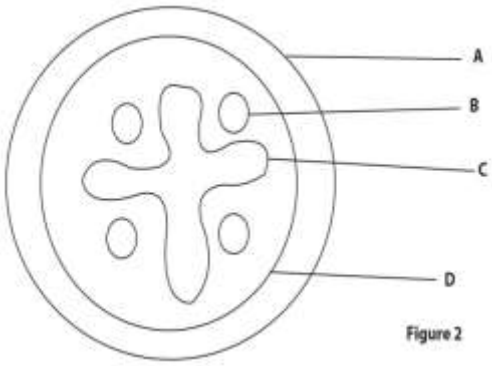

Figure 2

The part responsible for transporting water is

A. **A**.

B. **B**.

C. **C**.

D. **D**.

7. What is the probability that an albino man will have an albino son with an albino wife?

A. 0.25.

B. 1.

C. 0.

D. 0.5.

Turn Over

8. Which one of the following fins is most responsible for the forward movement in the fish?

A. Ventral fin.

B. Caudal fin.

C. Pectoral fin.

D. Pelvic fin.

9. Which one of the following is a storage molecule in a plant cell?

A. Galactose.

B Starch.

C Fructose.

D Glucose.

10. Which one of the following activities of man may lead to pollution of the environment?

A. introduction of fish in a pond to feed on the mosquito larvae.

B. covering of top soil with dry grass.

C. spraying pests with pesticides.

D. uprooting weeds from a garden.

11. A student added $40cm^3$ of water to $50cm^3$ of soil in a measuring cylinder and stirred. If the soil contained 30% of air by volume, what was the final volume of the mixture of soil and water?

A. $80\ cm.$

B. $60\ cm.$

C. $85\ cm.$

D. $75\ cm.$

12. Which one of the following endocrine glands is involved in regulating the osmotic pressure of blood?

A. Pancreas.

B. Pituitary.

C. Adrenal.

D. Thyroid.

13. Which one of the following occurs during inspiration in a mammal?

A. Pressure in lungs increased above atmospheric pressure.

B. Volume in lungs decreased to minimum.

C. Pressure in lungs lower than atmospheric pressure.

D. Pressure in lungs equal to atmospheric pressure.

14. Which one of the following is not true for a lumbar vertebra?

A. Long neural spine.

B. Long transverse process.

C. Broad centrum.

D. Extra extensions.

15. Which one of the following is not present in the glomerular filtrate?

A. Glucose.

B. Water.

C. Amino acids.

D. Erythrocytes.

16. A condition in flowers when the stamens mature faster than the carpels to prevent self pollination is termed as

A. dioecious.

B. protogyny.

C. protandry.

D. dichogamy.

17. Which one of the following ensures that only one sperm cell fertilizes an ovum in mammals?

A. Acrosomal reaction.

B. Cortical reaction.

C. Coitus interuptus.

D. Vasectomy procedure.

Turn Over

18. The diagram below shows a stage during cell division in a eukaryotic cell. Identify the stage if the cell had 6 pairs of chromosomes at the start.

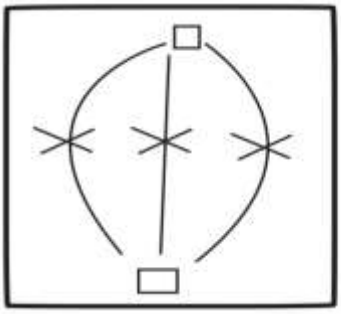

Figure 3

A. Metaphase II.

B. Anaphase II.

C. Metaphase I.

D. Anaphase I.

19. Which one of the following is not an evidence for evolution?

A. Comparative anatomy.

B. Embryology.

C. Fossil study.

D. Analogous structures.

20. Which one of the following can be caused by a diet short of mango fruits?

A. Beriberi.

B. Scurvy.

C. Pellagra.

D. Rickets.

21. The following are effects of hormones;

(i) Increased uptake and oxidation of glucose in cells.

(ii) Conversion of glucose to glycogen.

(iii) Conversion of fats to glucose.

(iv) Conversion of glycogen to glucose.

Which of the following are effects of insulin?

A. (i) and (ii).

B. (i) and (iii).

C. (ii) and (iii).

D. (i) and (iv).

22. Which one of the following is a permanent method of birth control in female?

A. Vasectomy.

B. Tubal ligation.

C. Use of IUDs.

D. Rhythm method.

23. Which one of the following is least important in germination of a seed?

A. Oxygen.

B. Warmth.

C. Light.

D. Water.

24. Which one of the following is not a characteristic for red blood cells?

A. Do not have a nucleus.

B. Carryout aerobic respiration.

C. Contain haemoglobin.

D. Do not use oxygen during respiration.

25. Which one of the following taxa is the simplest?

A. Kingdom.

B. Genus.

C. Family.

D. Class.

26. Which one of the following minerals is useful both in blood clotting and bone formation?

A. Magnesium.

B. Sodium.

C. Potassium.

D. Calcium.

Turn Over

27. An organism in a food chain that releases materials for reuse by green plants is called a

A. decomposer.

B. primary consumer.

C. secondary consumer.

D. primary producer.

28. Which one of the following fruits has free central placentation?

A. Mango.

B. Orange.

C. Tomato.

D. Green paper.

29. An individual lost memory and power of imagination after being involved in a accident, which of the following parts of the brain was greatly affected?

A. Cerebrum.

B. Hypothalamus.

C. Medulla.

D. Cerebellum.

30. Which one of the following is an example of discontinuous variation?

A. Height.

B. Skin colour.

C. Sex phenotype.

D. Body size.

Confirm answers for section **A** *in the grid below.*

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.	

SECTION B: (40 marks)

Answer **all** *questions in this section.*

Turn Over

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

31. (a) An experiment was carried out to show the effect of light intensity on the rate of photosynthesis. The experiment was set up as in the figure below:

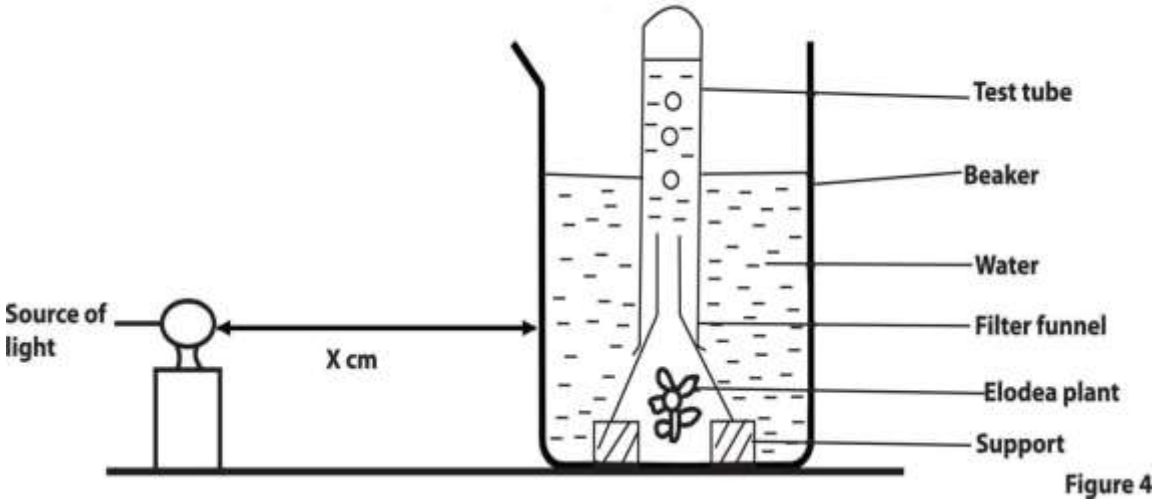

Figure 4

Sodium bicarbonate was added to the water in the beaker. The rate of photosynthesis was obtained by counting the number of bubbles of oxygen given off per minute as the distance ***X*** was varied the results that were obtained as shown in the table below.

Turn over

Distance *X* in cm.	**Number of oxygen bubbles given off per minute.**
5	30
10	25
15	15
20	10
25	5
30	2

(a) Present the data in the table above on a suitable graph. (06 marks)

(b) Describe the trend of the graph. (03 marks)

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(c) Explain the trend of the graph. (03 marks)

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(d) (i) Why was the filter funnel placed on top of supports and not the bottom of the beaker? (02 marks)

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(ii) What was the use of sodium bicarbonate added to the water in the beaker? (01 mark)

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(e) (i) Counting the bubbles of oxygen given off is not the best method of determining the rate of photosynthesis, explain. (02 marks)

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(ii) Explain what would happen if a black plastic cup was used instead of a glass beaker. (03 marks)

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32. The diagram below shows positions of some endocrine glands in the human body.

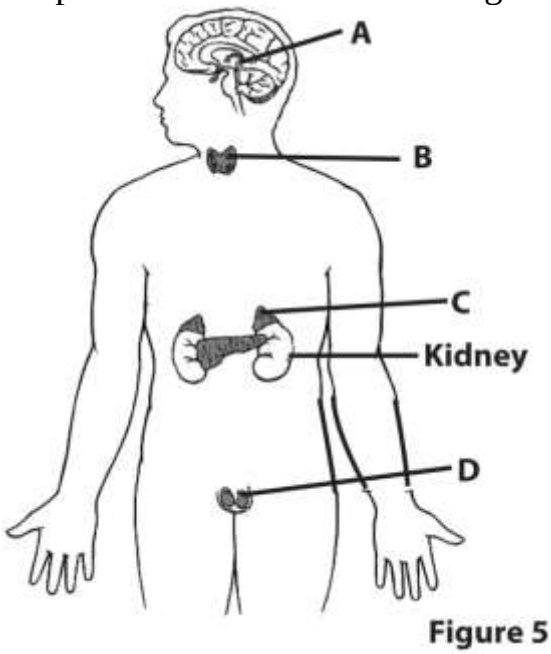

Figure 5

(a) Name the glands labelled; (03 marks)

A ……...

B ……...

C ……...

Turn Over

(b) Explain how gland **A** controls the activity of gland **C**. (03 marks)

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(c) State **three** tropisms and in each case, give **one** benefit of the tropism to the plant. (03 marks)

(i) Tropism: ……

Benefit: ……

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(ii) Tropism: ……

Benefit: ……

……

(iii) Tropism: ……

Benefit: ……

……...

33. (a) (i) What is vegetative propagation in plants? (01 mark)

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(ii) State **three** advantages of vegetative propagation. (03 marks)

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(b) The figure below shows a certain stage during sexual reproduction in a plant.

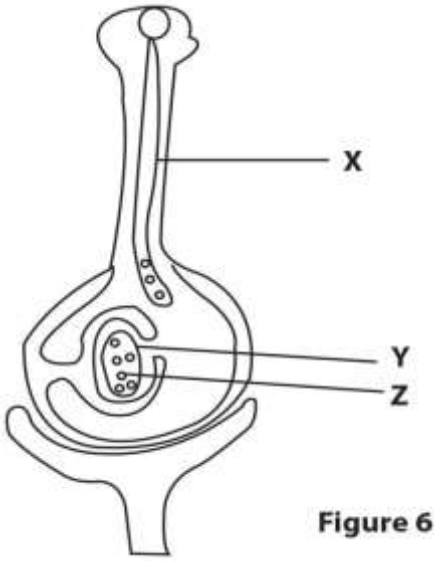

Figure 6

(i) Name the labelled structures. (03 marks)

X ……

Y ……

Z ……

(c) State **three** advantages of sexual reproduction in plants. (03 marks)

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SECTION C: (30 marks)

Attempt only **two** *questions.*

34. (a) In cattle the gene for hornless condition is dominant over the gene for horned condition. Using suitable genetic symbols, make crosses to determine the genotypes and phenotypes of the offspring got by crossing pure (true) breeding lines of the mentioned conditions. (06 marks)

(b) What will be the phenotypes of the offspring after crossing a heterozygous hornless cow and a bull whose horns were completely cut off. (Show your working). (06 marks)

Turn over

(c) (i) What is discontinuous variation? (01 mark)

(ii) State **two** examples of discontinuous variation in humans. (02 marks)

35. (a) What is a respiratory surface? (02 marks)

(b) Explain how the respiratory surfaces are adapted to the process of gas exchange. (06 marks)

(c) (i) Write **four** differences between respiration and photosynthesis. (04 marks)

(ii) Explain compensation point. (02 marks)

36. (a) Explain the importance of the following components of soil;

(i) Humus. (05 marks)

(ii) Soil organisms. (04 marks)

(b) Describe an experiment to show that clay soil has higher capillarity than loam soil. (06 marks)

37. (a) Distinguish between locomotion and movement. (02 marks)

(b) Explain the importance of a skeleton in a mammal. (05 marks)

(c) Describe the instabilities that occur in a fish during locomotion in water, and state how each is overcome. (08 marks)

END