Name:……**Centre/Index No:**……/……

553/1
BIOLOGY
THEORY
Paper 1
AUGUST, 2017
2½ hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS AUGUST, 2017

BIOLOGY

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 sections **A** *and* **B** *must be written in the spaces provided in the question paper*

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 is a set of bones found in the human hind limb only?
   A. Femur, radius, ulna
   B. Femur tibia, fibula
   C. Humerus, radius, ulna
   D. Humerus, tibia, fibula

2. Ferns are grouped as non flowering plants because they
   A. grow in swamps
   B. are not attractive to bees
   C. do not use flowers as reproductive organs
   D. produce spores on the underside of their leaves.

3. Unlike animals plants do not need special excretory organs because they
   A. do not produce wastes
   B. produce only gaseous wastes
   C. eliminate their wastes instantly
   D. produce less toxic wastes slowly

4. A grass hopper is classified as an insect because it has
   A. two pairs of legs
   B. three pairs of legs
   C. a hard cuticle and jointed legs
   D. compound eyes and vertebral column

5. Which trio of insects below has similar feeding habits?
   A. Bee, butterfly and bed bug
   B. Bee, mosquito and caterpillar
   C. Tsetsefly, housefly and caterpillar
   D. Housefly, cockroach and praying mantis

6. Which one of the statements below is common to rhizomes, bulbs and corms? They….
   A. all have no leaves

B. are swollen aerial stems
C. have stems that run in a horizontal profile
D. have underground stems or they are underground stems.

7. What does a species mean as used in classifying living organisms?
A. A population of many classes of organisms
B. Living organisms in the same environment
C. A group of organisms that breed together successfully
D. A population of organisms that depend on each other for food.

8. Which of the following lists shows the correct order, starting from the smallest to the largest?
A. Cells, organelles, organs, tissues, organ systems
B. Organelles, cells, tissues, organs, organ systems
C. Cells, organs, organ systems, tissues, organelles
D. Organ systems, organs, organelles, tissues, cells

9. Which one of the following is the only way in which plant cells differ from animal cells?
Plant cells
A. are larger
B. are all living
C. are not as specialized
D. have a cellulose cell wall.

10. Which one of the following lists of minerals usually constitute the fertilizers added to the soil?
A. Phosphorus, Nitrogen and Potassium
B. Potassium, Nitrogen and Magnesium
C. Phosphorus, Nitrogen and Magnesium
D. Phosphorus, Potassium and Magnesium

11. Which one of the following bacteria are responsible for converting nitrates into free atmospheric nitrogen?
A. Nitrifying bacteria
B. Putrefying bacteria
C. Denitrifying bacteria
D. Nitrogen fixing bacteria

12. Which one of the following when added to the diet would most improve the growth of teeth in an affected child?
A. Vitamin D
B. Vitamin C
C. Vitamin E
D. Phosphate ions

13. Which one of the following food chains would represent a possible flow of energy in an ecosystem?
A. Seeds → mouse → bacteria → owl
B. Mouse → owl → bacteria → seeds
C. Seeds → mouse → owl → bacteria
D. Seeds → owl → mouse → bacteria

14. Why is the control of pests by pesticides rarely 100% successful? This is because
    A. the pesticides kill other organisms as well as the insect pests.
    B. the pests breed and spread too fast for the pesticide to be effective
    C. the population of pests vary so much that it is not possible to make pesticides of sufficient variety to control all species.
    D. some of the pests resist the pesticides and this resistance becomes wide spread through natural selection mechanisms.

15. Which one of the following is a function of the villi? To
    A. act as a sieve for undigested foods
    B. move undigested food along the gut
    C. increase the surface area of the gut wall.
    D. secrete the intestinal juices for digestion.

16. Which of the following blood groups can receive blood transfusion from any other person?
    A. O B. A C. B D.AB

17. Which of the following is the function of the semilunar valves in the pulmonary artery and aorta? To
    A. increase arterial pressure
    B. maintain the pulse in the arteries
    C. prevent back flow of blood into the ventricles.
    D. close off the exits from the heart when it contracts

18. Which one of the following would be the most practical method to use when asked to find out the most common plant species in a relatively large habitat?
    A. A quadrat
    B. A line transect
    C. A map to show the distribution of all plants
    D. To count every individual of each species in the habitat.

19. Why do birds' beaks and claws differ greatly from one kind of bird to another? These are adaptations to
    A. the different trees they live on
    B. their differences in body sizes and weight
    C. the different types of food they depend on
    D. the fact that some hang upside down on branches of trees.

20. What is the relevancy of a shoot being prepared for a transpiration experiment to be cut while under water? To
    A. prevent loss of sap.
    B. remove damaged tissues
    C. avoid water loss that may cause wilting
    D. prevent air from entering the xylem vessels

21. Which one of the plant structures below provides a large surface area necessary for obtaining water from the soil?
A. Guard cells
B. Root hairs
C. Flat leaves
D. Xylem tissue

22. During anaerobic respiration in plant cells, the breakdown of glucose produces
A. alcohol and water
B. water and carbon dioxide
C. alcohol and carbon dioxide
D. carbon dioxide and lactic acid

23. Which one of the following describes the movement of ribs during exhalation in man?
A. Raised and farther apart
B. Raised and close together
C. Lowered and farther apart
D. Lowered and close together

24. In which of the following structures does the female grasshopper store the sperms after mating?
A. Ovary
B. Sperm sac
C. Abdomen
D. Ovipositor

25. Which one of the following lists represents the floral leaves of a flower?
A. Sepals, calyx, corolla and carpels
B. Sepals, petal, corolla and carpels
C. Calyx,corolla,stomata and androecium
D.Calyx, corolla, androecium and gynoecium

26. Which one of the following plant leaf adaptations may not enhance photosynthesis?
A. Being hairy
B. Having a thin lamina
C. Possession of chloroplasts
D. Presence of intercellular spaces

27. Which one of the following is an excretory function of the liver?
A. Production of vitamin B_{12}
B. Conversion of glucogen to glucose
C.Conversion of amino acids to urea
D.Conversion of fats to fatty acids and glycerol

28. Which one of the following is an effect of the release of adrenaline into the bloodstream?
A. Causes the change of glucose to glycogen
B. Causes regrowth of the lining of the uterus
C. Speeds up the rate of growth of the skeleton
D. Increases the flow of blood to the skeletal muscles

29. Haemophilia is caused by a
A. recessive gene carried on the X chromosome
B. recessive gene carried on the Y chromosome
C. dominant gene carried on the X chromosome
D. dominant gene carried on the Y chromosome

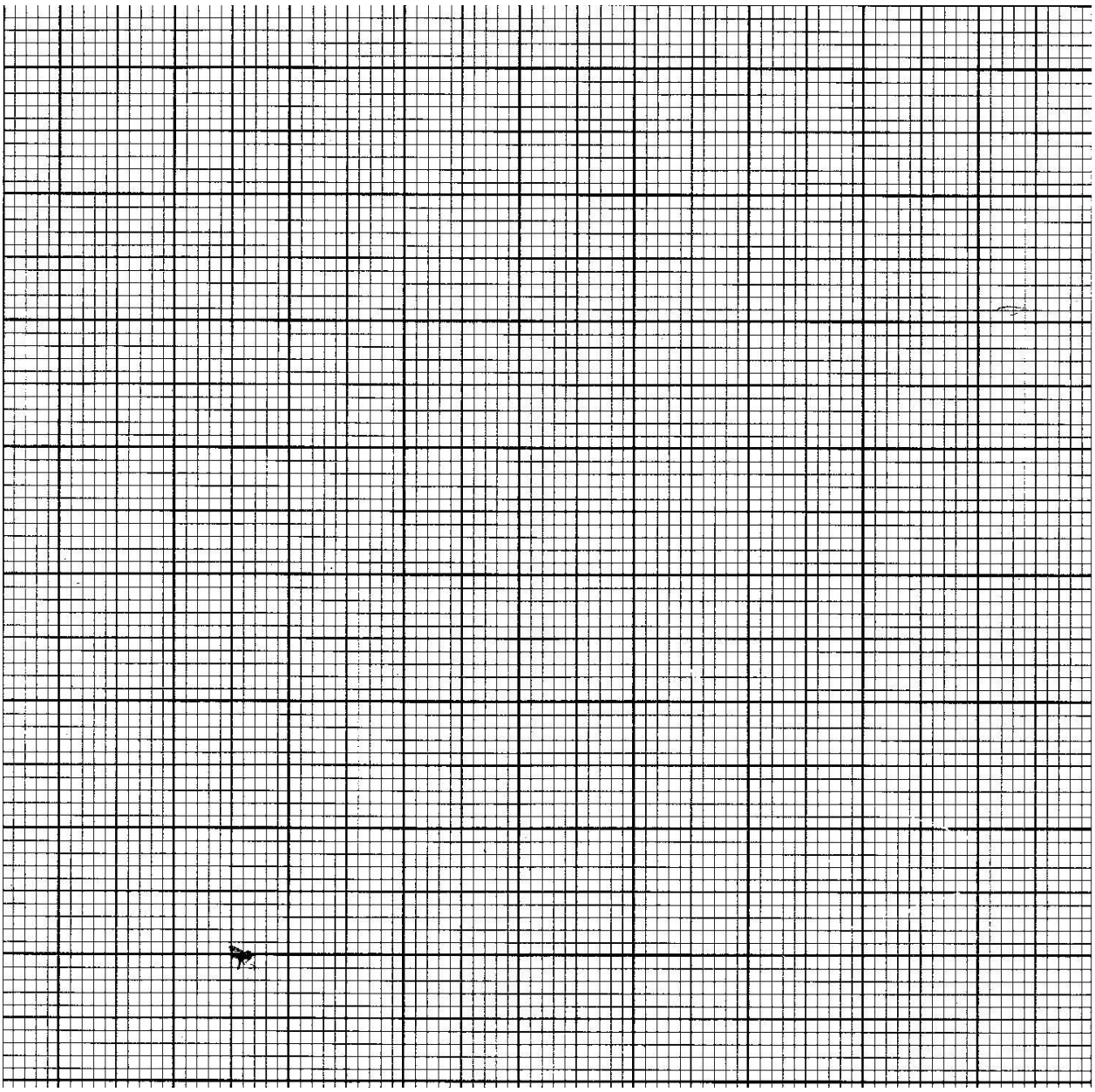
30. Color blindness is a sex linked recessive trait in man. A woman with normal sight marries a color blind man. Assuming that they have several children, which of the following chances will be most correct?
    A. All of the sons will be color blind
    B. All of the daughters will be color blind
    C. None of the sons or daughters will be color blind
    D. None of the sons will be color blind but the daughters will.

SECTION B (40 MARKS)
Answer all questions in this section
Answers must be written in the spaces provided.

31. The table below shows the rate of activity of an enzyme at different temperatures

Temperature / centigrade	Rate/mg of product per minute
0	1.8
5	2.4
10	3.7
15	4.9
20	7.4
25	9.3
30	13.4
35	17.2
40	19.0
45	19.0
50	8.1
55	1.7
60	0

(a) Represent the information in the table above in a suitable graph on the graph paper below. (6 marks)



(b) (i) State the optimum temperature for this enzyme. (1 mark)

_____

(ii) Explain the rate of activity at 17 degrees centigrade (2 marks)

_____

_____

_____

(iii) Explain the results at temperatures above 45 degrees centigrade. (2 marks)

_____

_____

_____

(c) Name four factors other than temperature which would affect the rate of enzyme activity. (4 marks)

(i)_____

(ii) _____

(iii)_____

(iv)_____

(d) Name three other factors which would bring similar results as in (b) iii above

(i) _____ (3 marks)

(ii) _____

(iii) _____

(e) If the enzyme used in the experiment above was Amylase, name the;

(i) substrate:_____

(ii) products:_____ (2 marks)

32. (a) Describe the results which occur when a cell nucleus divides by mitosis. (2 marks)

_____

_____

_____

(b) What is the significance of mitosis taking place in the following structures? (4 marks)

(i) The skin epidermis:

_____

_____

_____

(ii) Bone marrow

_____

_____

_____

(c) Depending on the nature of cell, under ideal conditions it can grow and divide in thirty minutes. Starting with one cell, how many cells would be formed in such ideal conditions in a period of three hours? (1 mark)

_____

(d) (i) Give another kind of nuclear division that takes place other than the one stated in (a) above. (1 mark)

_____

(ii) Identify two organs in which this nuclear division takes place and in each case, name the cells which are formed. (2 marks)

Organ:_____

Cells formed:_____

Organ:_____

Cells formed:_____

33. (a) Distinguish between diffusion and osmosis (2 marks)

_____

_____

_____

_____

_____

(b) Highlight four uses of osmosis to plants. (4 marks)

i_____

_____

ii_____

_____

iii_____

_____

iv_____

_____

(c) Fill in the table below to show the differences between transpiration and translocation. (4 marks)

Transpiration	Translocation
i	
ii	
iii	
Iv	

SECTION C (30 MARKS)

Answer two questions from this section. Answers are to be written in the answer sheets provided.

34. (a) Describe the terms pollination and fertilization. (4 marks)

(b) Describe the series of events that take place after pollination until the formation of a mature seed. (11 marks)

35. (a) Draw and label a diagram to show the hinge joint in the lower limb of man. (4 marks)

(b) Describe fully how the bones of the above joint and muscles bring about movement. (11 marks)

36. (a) Describe how fresh air gets into the lungs of a human being. (6 marks)

(b) With the aid of a diagram, explain how oxygen from the alveolar air reaches haemoglobin in the blood. (9 marks)

37. (a) Outline the essentials of a locomotory system (3 marks)

(b) Highlight the basic functions of the skeleton to an animal. (5 marks)

(c) Describe how birds are adapted for flight. (7 marks)

