NAME:……. **STREAM**……

SENIOR four

553/1

Biology

PAPER 2

Exam 1

2 HOURS 30 MINUTES

INSTRUCTIONS

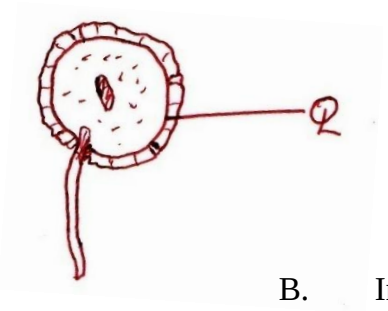
- *Answer all questions in sections **A** and **B** in the spaces provided on the question paper and any two questions from section **C**.*
- *Answer section **A** by writing the correct alternative **A,B,C** or **D** in the box on the right hand side of each question.*

FOR EXAMINER'S USE ONLY			
Section		**Marks**	**Examiner's Initials**
A			
B	31		
	32		
	33		
C	No:		
	No:		
Total			

SECTION A

Write the correct answer in the box at the end of the question.

1. The diagram below shows the structure of a germinating pollen grain. Part Q represents the

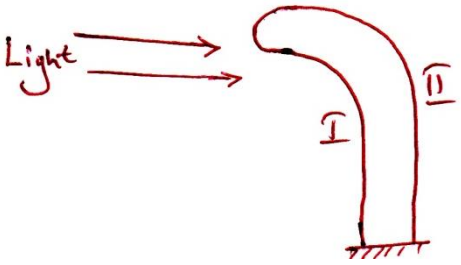


A. Exine
B. Intine
C. Tube nucleus
D. Male nucleus

2. Leaves from a certain plant were found to have a thick waxy cuticle. The same plant is most likely to have had
   A. Very few stomata
   B. Very many leaves
   C. Broad leaves
   D. Stomata on the upper and lower surface of leaves

3. A deep keel in birds is intended to
   A. Reduce wait
   B. Increase surface area
   C. Insulate the body
   D. Streamline the body

4. The diagram below shows a shoot of plant growing near the window inside a laboratory. The reason for the direction of growth is



   A. A higher auxin concentration on side II
   B. A faster cell division on side II
   C. A faster cell elongation on side I
   D. A faster cell division on side I

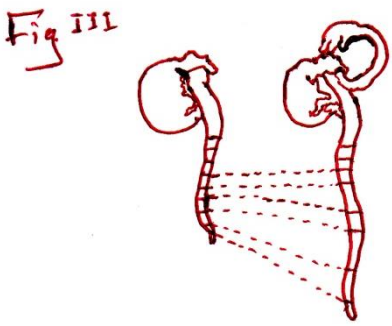
5. The type of cells shown in figure II are found in the ;

A. Oviduct
B. Ileum
C. Artery
D. Retina

6. A diastema is commonly associated with animals that are
A. Herbivorous
B. Carnivorous
C. Omnivorous
D. Insectivorous

7. A student carried out an experiment using a variegated leaf. The aim of the experiment was to find out whether
A. The leaf contains starch
B. Chlorophyll is necessary for photosynthesis to occur
C. Light is necessary for photosynthesis to occur
D. Oxygen is produced during photosynthesis

8.



The set up in fig III aimed at showing
A. That roots emerge before shoots
B. That shoots grow faster than roots
C. The region of cell elongation
D. That oxygen is necessary in germination

9. The column of water held in the xylem vessels without breaking during transpiration is due to;
A. Transpiration pull
B. Root pressure
C. Osmosis
D. Cohesion and adhesion

10. It is true all the arteries carry
    A. Oxygenated blood
    B. Deoxygenated blood
    C. Blood towards the heart
    D. Blood away from the heart

11. Ethanol and lactic acid are similar in that both are
    A. Bi-products of aerobic respiration
    B. Products of plant metabolism
    C. Products of animal metabolism
    D. Produced the absence of oxygen

12. The aim of panting in dogs is to
    A. Pay the oxygen debt
    B. Cool the body
    C. Remove the excess carbon dioxide
    D. Increase metabolism

13. Increased solute concentration in the human blood would lead to increased production of
    A. Anti-diuretic hormone
    B. Insulin hormone
    C. Adrenaline hormone
    D. Thyroxine hormone

14. When organisms detect and adjust to the changing environment conditions, the process is known as
    A. Reproduction
    B. Locomotion
    C. Irritability
    D. Ecology

15. Which one of the following processes is not metabolism?
    A. Egestion
    B. De-amination
    C. Respiration
    D. Osmoregulation

16. The structure in the mammalian heart which prevents mixing of oxygenated and de-oxygenated blood is the
    A. Pericardium
    B. Bicuspid valve
    C. Tricuspid valve
    D. Septum

17. Beetles which feed on the water hyacinth were bred and used to clear this aquatic weed. This is known as
    A. A food chain
    B. Mimicry
    C. Biological control
    D. Competition

18. Which one of the following contraceptive methods is the most effective?
    A. Tubal ligation
    B. Rhythm method
    C. Withdraw method
    D. Spermicides

19. Which one of the following protects the foetus from mechanical injury?
    A. Amnion sac
    B. Placenta
    C. Umbilical cord
    D. Ovary

20. The type of joints found between the bones of cranium are known as
    A. Hinge
    B. Ball and socket joint
    C. Gliding
    D. Fixed

21. A succulent fruit with many seeds is called
    A. Pome
    B. Legume
    C. Berry
    D. Drupe

22. Which one of the following statements is correct?
    A. During day only photosynthesis takes place
    B. Both photosynthesis and respiration proceed at the same time in plants during day
    C. During day only oxygen is released from green plants
    D. Twice as much oxygen is released than carbon dioxide during photosynthesis.

23. Ovulation in the human female is triggered off by the
    A. Estrogen hormone
    B. Progesterone hormone
    C. Luteinizing hormone
    D. Follicle stimulating hormone

24. Natural selection is commonly associated with
    A. Charles Darwin
    B. Gregor Mendel
    C. Thomas Hunt
    D. Alfred Wallace

25. While cellulose is made up of thousands of glucose molecules, proteins are made up of thousands of
    A. Fatty acids
    B. Amino acids
    C. Fructose
    D. Glycerol

26. The image formed by the human eye on the retina is
A. Virtual, diminished and erect
B. Virtual, diminished and inverted
C. Real, diminished and inverted
D. Real, magnified and erect

27. Which one of the following sets of events lead to exhalation in man?
A. contraction of diaphragm, decrease in volume, increase in pressure
B. relaxation of diaphragm, decrease in volume, increase in pressure
C. relaxation of diaphragm, decrease in volume, decrease in pressure
D. contraction of diaphragm, increase in volume, decrease in pressure

28. During down stroke in wings of a bird, the following occur
A. pectoralis minor muscles contract and wings are lowered
B. pectoralis minor muscles contract and wings are raised
C. pectoralis major muscles contract and wings are lowered
D. pectoralis major muscles relax and wings are lowered

29. A soil sample with high capillarity most likely has
A. High aeration
B. High water retention
C. Low mineral content
D. Corse particles

30. Which one of the following features in man exhibits continuous variation?
A. Albinism
B. Height
C. Blood groups
D. Hemophilia

SECTION B.

31. The data below shows the number of bubbles produced per minute at $15^{O}C$ and $37^{O}C$ from an aquatic plant when it was exposed to light from a 100 W electric bulb at several distances from the setup of the plant in water. The bubbles produced are taken as the rate of photosynthesis. Study it carefully and use it to answer questions that follow.

Distance of the bulb from the plant / cm	5	10	20	30	40	50	55	60	65
No. of bubbles produced at $15^{O}C$	400	360	290	220	160	100	70	50	30
No. of bubbles produced at $37^{O}C$	810	750	630	500	390	310	270	200	175

(a) (i) Plot a graph of number of bubbles produced and the distance of bulb from the plant using the same axes. *(10 marks)*

(ii) What was the experiment intended to demonstrate? *(01 mark)*

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(iii) Describe the shape of the graph at 37^{o}C from your results *(2 marks)*

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(b) Explain the difference in number of bubbles by the same plant at 15^{O}C and 37^{O}C *(03marks)*

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(c) Apart from the factors given state other factors that would affect the rate of photosynthesis in the aquatic plant. *(02 marks)*

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State two importance of photosynthesis. *(02marks)*

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(d) Give two reasons why a leaf is put in boiling water while testing for starch. *(01 marks)*

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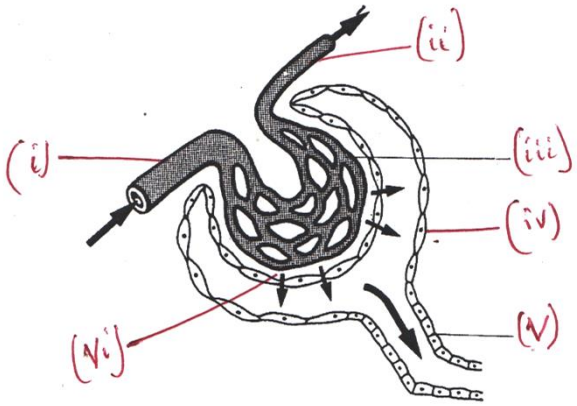
32. The diagram below shows part of the human nephron



a) Name the labeled parts; *(03 marks)*

i. …… iv ……

ii. …….. v ……

iii. …….. vi ……

b) Explain how part (vi) is adapted for its function. *(02 marks)*

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c) What is the importance of the diameter of vessels (i) and (ii)? *(01 mark)*

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d) State the importance of the process which occurs in part (v). *(04 marks)*

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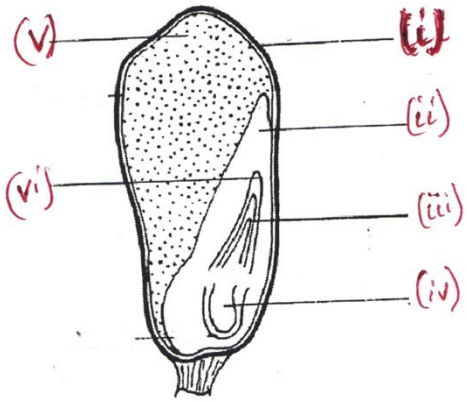
33. The figure below shows the structure of a maize grain:



(a) Name the labeled parts *(03mark)*

(i)…… (iv) ……..

(ii)…… (v) ……...

(iii)…… (vi)…….

(b) State the functions of parts (iii) and (v). *(01 mark)*

Part(iii)

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…….……

Part(v)

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…….……

State the changes that occur in parts (i),(iv) and (v) during germination(*03 marks)*

Part(i) ……

…….……

Part(iv)

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…….……

Part(v)

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(c) State the conditions needed for the changes in c above to occur. *(03 marks)*

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SECTION C

Answer two questions only

34. (a) What are gonads? *(01 mk)*
    (b) State the functions of human gonads. *(07 mks)*
    (c) Describe the differences between reproduction in humans and amphibian. *(07 mks)*

35. During a Mendellian genetic experiment, 898 plants were obtained in the F_2 of which 225 had wrinkled seeds and the rest had round seeds.
    (a) Work out the phenotypic ratio *(02 mks)*
    (b) Which plants above have the dominant character? Give reasons for your answer. *(02 mks)*
    (c) Use suitable symbols to show how the above results were obtained. *(11 mks)*

36. (a) Explain why digestion of food is very important *(02 mks)*
    (b) What is the importance of human a stomach. *(05 mks)*
    (c) What is the fate of the products of digestion of; *(08 mks)*
        (i) Starch
        (ii) Protein.

37. (a) State the importance of plant shoot response to gravity. *(03 mks)*
    (b) In which ways does removal of a hand from a hot object differ from plant shoot growth towards light? *(05 mks)*
    (c) Describe the path taken by an impulse to cause removal of hand from a hot object. *(07 mks)*

END.