NAME:.....INDEXNUMBER.....

SIGNATURE .....

553/1
BIOLOGY
Paper 1
July/August 2009
2 hours 30 minutes

WAKISSHA JOINT MOCK EXAMINATION
Uganda Certificate of Education
Biology
Paper 1
2 hours 30 minutes

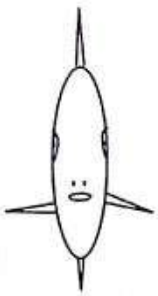
INSTRUCTIONS:

- *This paper consists of **three** sections*
- *Answer **all** questions in section **A** and **B** and any **two** questions in section **C***
- *Circle the best answers in sections A. Answers to section B must be written in the spaces provided only.*

FOR EXAMINER'S USE ONLY.	
SECTION A	
SECTIONB	
SECTION C: NO.	
NO.	
TOTAL	

SECTION A

1. The figure 1 below shows a head of a fish.



From which view was the specimen taken?

a) Posterior view
b. Dorsal view
c. Anterior view
d. Ventral view

2. The bleeding of gums whenever one tries to brush teeth indicates shortage of which of the following in the diet?

a) Beans
c) milk
b) meat
d) Mangoes

3. Three leaves P, Q and R were taken from three potted plants kept in different conditions as follows:-

- Leaf P from a potted plant kept in darkness.
- Leaf R from a potted plant kept in a Carbondioxide free atmosphere.
- Leaf Q from a potted plant kept in an open garden

The leaves were later tested for the presence of starch after one hour. Which leaves did NOT give a dark blue colouration when tested with iodine?

a. P and Q
b. Q and R
c. P and R
d. None of the leaves.

4. The spongy mesophyll layer in the leaves is largely responsible for;

a. Photosynthesis
b. Transpiration
c. Gaseous exchange
d. Excretion.

5. During the life cycle of the blood fluke many eggs may pass out of man through urine and feaces. While in the water, the eggs hatch into swimming form and may enter a snail. In such a case, we say the snail is a;

a. Primary host
b. parasite
c. secondary vertebra
d. Nematode.

6. Cervical vertebra is different from thoracic vertebra because;

a. cervical vertebra has neural canals
b. thoracic vertebra has neural spine.
c. cervical vertebra has verterbrarterial canals
d. thoracic vertebra has a centrum.

7. Which of the following changes occurs on walking out of bright sunshine into a poorly lit room?

a. The lense becomes thicker
b. The ciliary muscle relaxes
c. The eyes become blind
d. The pupils become larger.

8. A pure breeding tall pea plant was crossed with a heterozygous tall pea plant which one of the following represents the correct percentage of offspring?

a. 100% tall
b. 50% tall and 50% short
c. 75% tall and 25% short
d. 25% tall and 75% short

9. Three funnels X, Y and Z were plugged with cotton wool at their bases and were then filled to the same level with loam, clay and sandy soils. Then 500cm^3 of water was added into each of these funnels. The filterates collected at the end of thirty minutes were as follows:- X=450cm^3, Y = 300cm^3, Z = 400cm^3. Which funnel(s) contained clay soil?

a. X
b. X and Z
c. Y
d. Y and Z

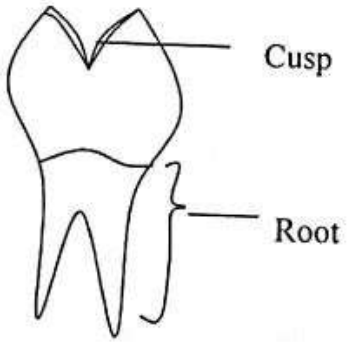
10. Which one of the following can best be used to determine the approximate number of fish in a given pond?
a. gill netting
b. quadrat
c. sweep netting
d. mark capture – recapture method.

11. The science of sorting organisms into groups on the basis of their common characteristics is called;
a. classification
b. taxonomy
c. binomial system
d. nomenclature

12. Which one of the following yields the least amount of energy during respiration?
a. fatty meat
b. lean meat
c. sugarcane juice
d. fruit juice

13. A plant with a poorly developed root and shoot system is most likely to be lacking.
a. calcium
b. magnesium
c. sulphur
d. boron

14. The structure below shows the side view of a human tooth. Study and identify it.

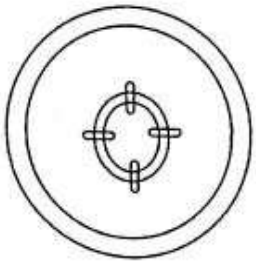


a. Molar
b. Premolar
c. Canine
d. Incisor

15. Which valve ensures that blood flows from the left atrium to the left ventricle and NOT the reverse?

a. Tricuspid valve
b. Bicuspid valve
c. semi lunar valve
d. pocket valve.

16. The figure 2 below shows a transverse section of a part of a plant.



What part of the plant is represented?

a. dicotyledonous stem
b. monocotyledonous stem
c. dicotyledonous root
d. monocotyledonous root

17. Leguminous plants are characterized by;

a. production of seeds in a capsule pod
b. production of seeds in a follicle pod
c. presence of nodes in shoots
d. presence of nodules in roots

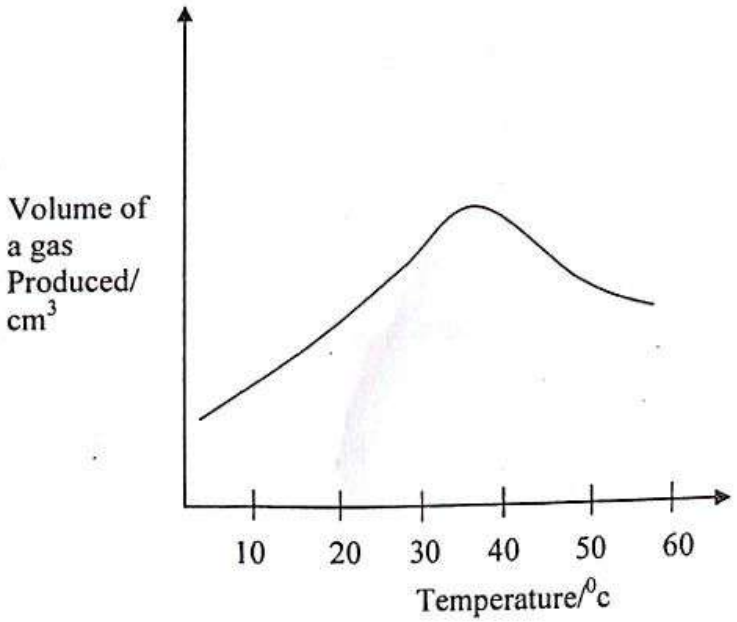
18. The following events occur in seeds during germination.

i. Seed coat splits
ii. Hypocotyl grows fast
iii. Epicotyl grows fast
iv. Cotyledons appear above the ground
v. Cotyledons remain below the ground

Which of the following occur during epigeal germination?

a. i, ii, iii
b. i, iii, iv
c. i, ii, iv
d. ii and iv only

19. The graph below shows the volume of a gas produced during photosynthesis by a plant at different environmental temperature.



What is the possible reason for the fall in the volume of the gas after 40^0C?

a. there was no more oxygen in the atmosphere

b. there was no more Carbondioxide in the atmosphere

c. there was too much light intensity

d. enzymes were denatured.

20. Mitosis is necessary in the unicellular organism for;

a. Tissue formation

b. A sexual reproduction

c. Variation

d. Growth in size

21. Glomerular filterate has a higher percentage of water than urine because;

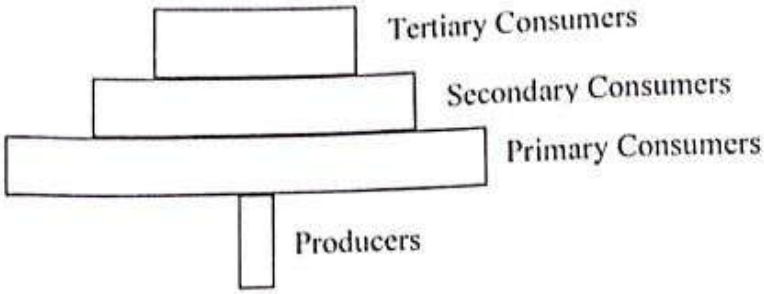
a. glomerular filtrate is produced at a greater rate than urine.

b. the nephrone adds salts to the urine making it more concentrated.

c. water is added to the glomerular filtrate from the blood.

d. water is reabsorbed from the glomerular filtrate into the blood.

22. The figure 3 below shows a pyramid of numbers for a food chain.



Which of the following correctly represents the information in the diagram?

a. a herd of antelopes in an African plain
b. a locust swarm in a maize field
c. a plague of caterpillars on a tree
d. round worms in a child's gut.

23. A certain species of rats produces a small volume of highly concentrated urine. It is reasonable to suggest that the most likely habitat of the rat is;

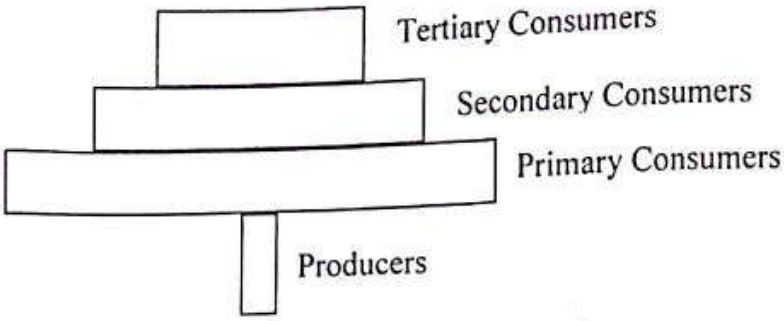
a. Savannah b. High mountain
c. Desert d. Lake area

24. What changes can take place in the composition of a mothers blood as it passes through the placenta?

	Glucose	Carbondioxide	Urea
A	Less	More	More
B	Less	More	Less
C	More	Less	Less
D	More	Less	More

25. The major functions of the eye piece lens in a light microscope is to;

a. reflect light through the specimen
b. move up and down to allow focusing
c. magnify the specimen
d. magnify the image of the specimen.



Which of the following correctly represents the information in the diagram?

a. a herd of antelopes in an African plain
b. a locust swarm in a maize field
c. a plague of caterpillars on a tree
d. round worms in a child's gut.

23. A certain species of rats produces a small volume of highly concentrated urine. It is reasonable to suggest that the most likely habitat of the rat is;

a. Savannah b. High mountain
c. Desert d. Lake area

24. What changes can take place in the composition of a mothers blood as it passes through the placenta?

	Glucose	**Carbondioxide**	**Urea**
A	Less	More	More
B	Less	More	Less
C	More	Less	Less
D	More	Less	More

25. The major functions of the eye piece lens in a light microscope is to;

a. reflect light through the specimen
b. move up and down to allow focusing
c. magnify the specimen
d. magnify the image of the specimen.

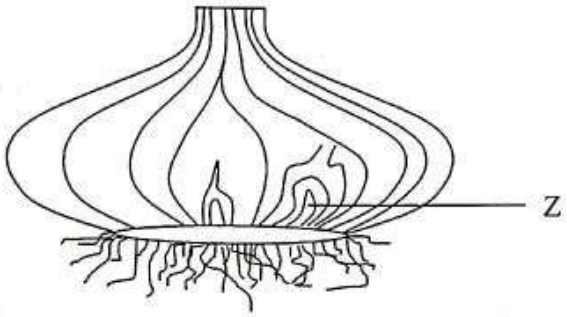
26. Arachnids can easily be identified by;

a. three pairs of legs
b. two body parts
c. two main body parts
d. a pair of antennae.

27. The cellulose cell wall of a plant cell does all the following except;

a. providing mechanical support to the plant
b. gives a cell shape
c. protects inner parts of the cell from mechanical damage.
d. provides necessary medium for chemical reactions.

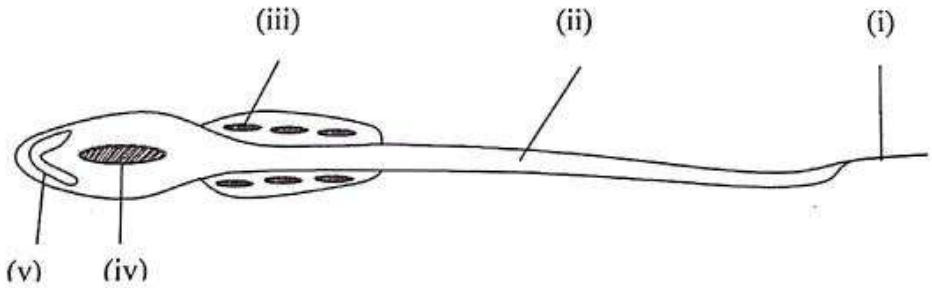
28. The figure 4 below shows the longitudinal section of a bulb.



What is the role of structure labeled Z?

a. anchorage
b. protection
c. food storage
d. vegetative propagation

29. Figure 5 below shows the structure of a sperm cell.



Which one of the following pairs consists of parts which contain the genetic material and provide energy for the cell during propulsion respectively?

a. (iv) and (i)

b. (v) and (ii)

c. (iii) and (i)

d. (iv) and (iii)

30. To identify food substances present in solution Y, a student performed the Following experiment;

Test	Observation
i). Solution Y heated with Benedict's solution	Solution remained blue
ii). Solution Y boiled with hydrochloric acid, cooled, sodium hydroxide solution added. Then the solution boiled again with Benedicts solution	Solution is turned from blue to orange precipitate.

Which of the following food substances was likely to be present in solution Y?

a. glucose

b. starch

c. glycogen

d. sucrose

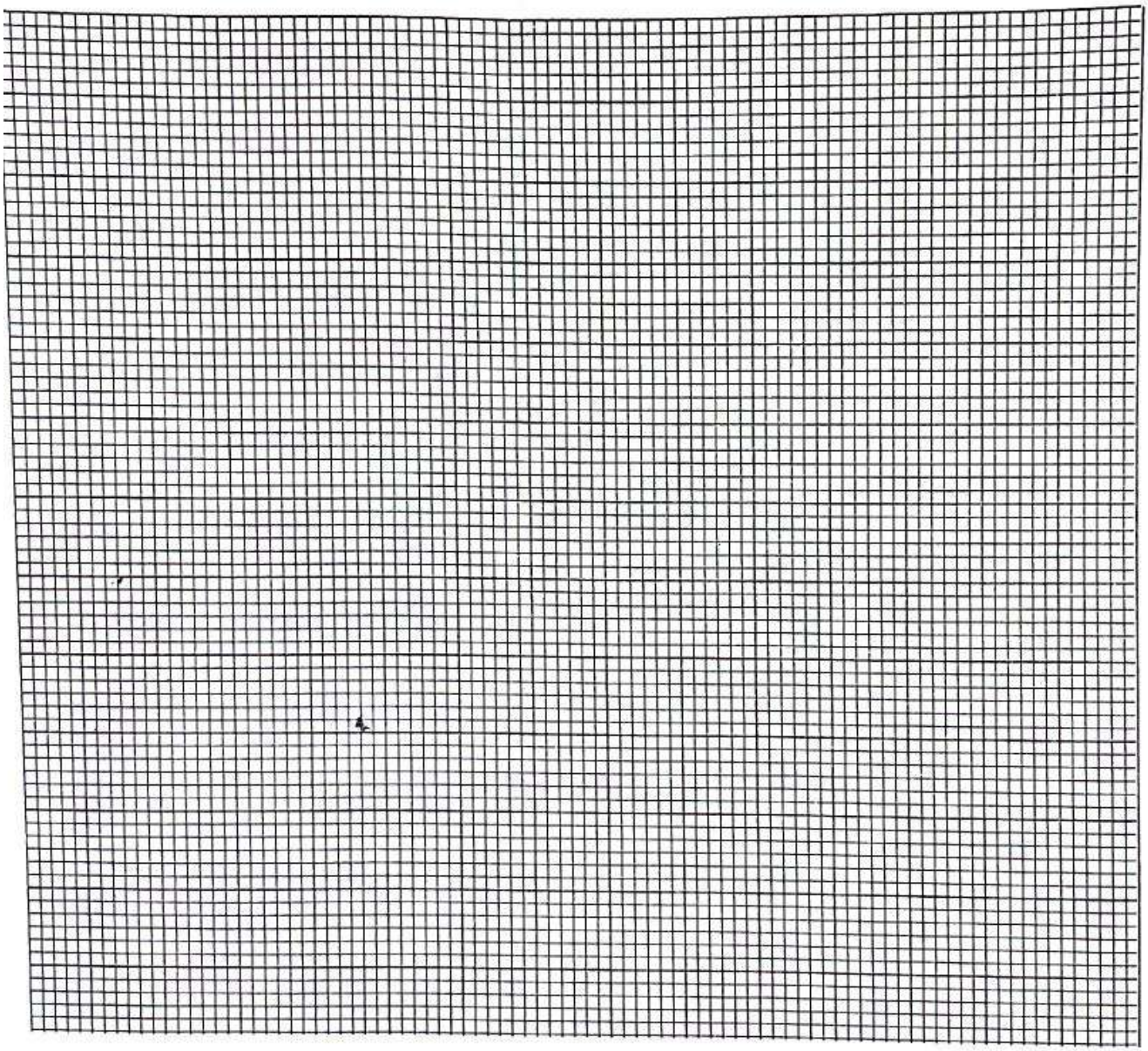
SECTION B

Attempt **all** the questions in this section

31) The following data represents the results obtained during a study on the rate of transpiration under two conditions using a potometer.

Stomatal aperture (µm)	0	4	9	13	17	19
Rate in still air (mm^3/min)	0	35	42	45	46	46
Rate in windy air (mm^3/min)	0	80	145	180	191	200

a. Plot a graph showing the variation in the rate of transpiration with stomatal aperture for the two conditions, on the same axes. (10marks)



b. Describe the shape of graphs in the two conditions (4marks)

c. Explain the shapes of the graphs obtained. (4 marks)

d. What is the stomatal aperture when the rate of transpiration in still air is $25mm^3$ per min? (01mark)

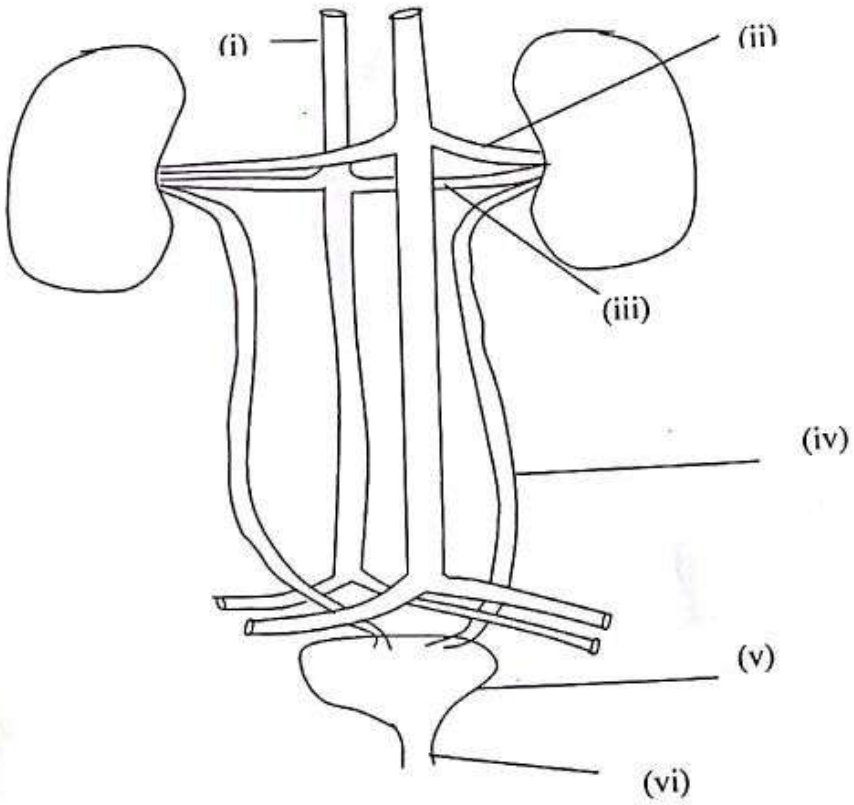
e. Apart from the environmental condition above, outline three other factors that affect the rate of transpiration. (1 ½ marks)

32. a) Define the term 'excretion' (2marks)

b) State one difference between excretion and secretion. (2marks)

d. The diagram below shows part of a human urinary system. Study it carefully and answer questions that follow:-

e.



(3marks)

Name the parts labeled

i._____

ii_____

iii_____

iv_____

v_____

vi_____

d. What is the function of the part labeled (01mark)

(i)._____

(v)._____

e. State two differences in the composition of the fluid flowing in structures ii and iii. (02marks)

Structure ii	Structure iii
i	
ii	

33 a) What is 'Sex linkage'? (01mark)

_____

_____

_____

_____

b. i) Haemophilia, a condition where blood does not clot very easily is sex linked and is caused by a recessive gene. Explain the fact that the named condition is common among males (02marks)

_____

_____

_____

_____

_____

ii) Using genetic symbols, show the genotypes and 'phenotypes of offsprings that will result, when a normal male marries a female who is a carrier of haemophilia (7marks)

SECTION C

Attempt any **two** questions form this section.

34. a) State the adaptations that enable birds to fly. (5marks)

b) Describe flapping flight in birds. (10marks)

35. a) State the characteristics of a good respiratory surface. (5marks)

b) Describe the mechanism of breathing in among human beings. (10marks)

36. a) Distinguish between osmosis and active transport. (02marks)

b) Explain how water is able to move from the soil up to the leaves, until it is lost to the surrounding atmosphere of a tall tree. (13marks)

37. Describe the human activities that lead to;

(i). degradation of soil environment (08marks)

(ii). pollution of the air (07marks)

END

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

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

553/1
BIOLOGY
THEORY
PAPER 1
July/August/2010
$2^{1}/_{2}$ hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

Paper 1

(THEORY)

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- Answer **all** questions in sections **A** and **B**, plus **two** questions in section **C**
- Write the answers to section A and B in the spaces provided and answers to section C in the answer booklet provided.

For Examiner's use only

Section	Marks	Examiner's signature and no.
A		
B No. 31		
No. 32		
No. 33		
C No.		
No.		
Total		

SECTION A (30MARKS)

1. The reactions below are catabolic except?
   A. Respiration
   B. Deamination
   C. Digestion
   D. Assimilation

2. The following events occur during breathing in fish.
   A. mouth open
   B. floor of buccal cavity lowers
   C. operculum opens
   D. pressure in the mouth decreases
   Which of them represent what happens during inspiration?
   A. (i), (ii) and (iv)
   B. (i), (iii) and (iv)
   C. (i), (ii) and (iii)
   D. (ii), (iii) and (iv)

3. The best method to prevent gully erosion on a cultivated hill is…
   A. mulching
   B. tree belts
   C. strip cropping
   D. contour ploughing

4. The leaves of mimosa pudica fold and drop when touched. This is an example of a,…
   A. Negative phototropism
   B. Positive thigmotropism
   C. Nastic response
   D. Tactic response

5. The following belong to the same group of organisms except;
   A. Penicillium
   B. Trypanosoma
   C. Entamoeba
   D. Plasmodium

6. Which one of the following organisms does not experience intermittent growth?
   A. Fish
   B. Toad
   C. Rabbit
   D. Grass hopper

7. Which one of the following is true of commensalism?
   A. Both organisms benefit
   B. One organism benefits and other is harmed
   C. One organism benefits other is un harmed
   D. One organism suffer some harm

8. Which of the following are products of anaerobic respiration in plants?
   A. Ethanol, carbon dioxide, energy
   B. Carbon dioxide, water, energy
   C. Lactic acid, carbon dioxide
   D. Ethanol, carbon dioxide, water

9. Which one of the following is **not** homeostatically regulated in the body?
   A. Glucose
   B. Water
   C. Carbondioxide
   D. Fat

10. Enzymes differ from other catalysts because enzymes;
    A. are required in small amounts
    B. are proteins in nature
    C. Speed-up reactions
    D. Respond to temperature changes.

11. Universal recipients are said to be with blood group AB, because;
A. They have antigens
B. They have both antibodies a and b
C. They have no antibodies
D. They have both antigens and antibodies

12. Why is it important to boil a leaf in ethanol while carrying out the test for starch in it?
A. To dissolve waxy cuticle
B. To make cells permeable to iodine
C. To remove chlorophyll
D. To stop chemical reaction in the cells

13. The source of the energy which flows through the food chain is?
A. Glucose
B. Oxygen
C. Respiration
D. Sunlight

14. Which of the following increases in muscle cells when they are lacking enough oxygen?
A. Bicarbonate ions
B. Lactic acid
C. Ethyl alcohol
D. Urea

15. What changes take place in the composition of a mother's blood as it passes through the placenta?

	Glucose	Carbondioxide	Urea
A.	less	more	more
B.	less	more	less
C.	less	less	more
D.	more	less	more

16. The number of chromosomes in the reproductive cell becomes haploid in the process of;
A. Meiosis
B. Mutation
C. Fertilization
D. Mitosis

17. Which one of the following pollutants released into air is the greatest contributor to acid rain?
A. Carbondioxide
B. Sulphur dioxide
C. Water waste
D. Soot

18. The concentration of a plant hormone which stimulates shoot growth.
A. also stimulates root growth.
B. inhibits root growth
C. causes branching of roots
D. makes the root turn down wards

19. Which one of the following pairs of bones is found in human fore limb?
A. Tibia and fibula
B. Tibia and humerus
C. Ulna and radius
D. Radius and fibula

20. Which one of the following is a density dependent factor controlling animal populations?
A. Temperature
B. Predators
C. Rainfall
D. Bush burning

21. Figure 1 below shows the transverse section through a mature orange fruit.

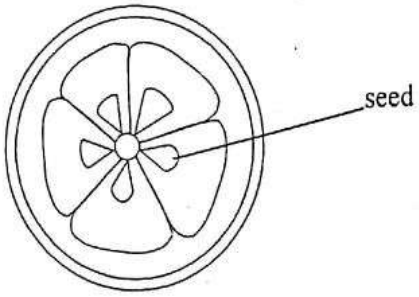


Fig 1

Which one of the following is the appropriate placentation shown by the fruit?
A. Basal B. Marginal C. Free central D. Axile

22. Which one of the following is the main difference between chilopods and diplopods?
A. Body colour
B. Body length and shape
C. Number of thoracic segments
D. Number of legs per segment

23. Which term is used to describe the lock and key fit that takes place between a molecule of an enzyme and its substrate?
A. Specific
B. Optimum
C. Synthetic
D. Hypothesis

24. An animal that hunts other animals for food is called?
A. Predator
B. Primary consumer
C. Decomposer
D. Prey

25. Which one of the following is **not** a vector?
A. Dragon fly
B. Tsetse fly
C. Tick
D. Housefly

26. Which one of the following set consist of substances that are stored in the liver?
A. Glucose, glycogen and vitamin D
B. Iron, glycogen and amino acid
C. Iron, glycogen and vitamin D
D. Urea, glycogen and Iron.

27. Which of the following pairs of corrective mechanisms would occur in response to an increase in body temperature?
A. Dilation of blood capillaries in the skin and contraction of hair erector muscles.
B. Dilation of blood capillaries in the skin and relaxation of hair erector muscles
C. Constriction of blood capillaries in the skin and relaxation of erector muscles.
D. Constriction of blood capillaries in the skin and contraction of hair erector muscles.

28. Which of the following is the functional adaptation of a molar tooth?
A. Sharp pointed end
B. Flat smooth top
C. Ridged surface
D. Many roots

29. Figure 2 below shows a set up of an experiment to investigate the action of enzyme catalase on hydrogen peroxide.

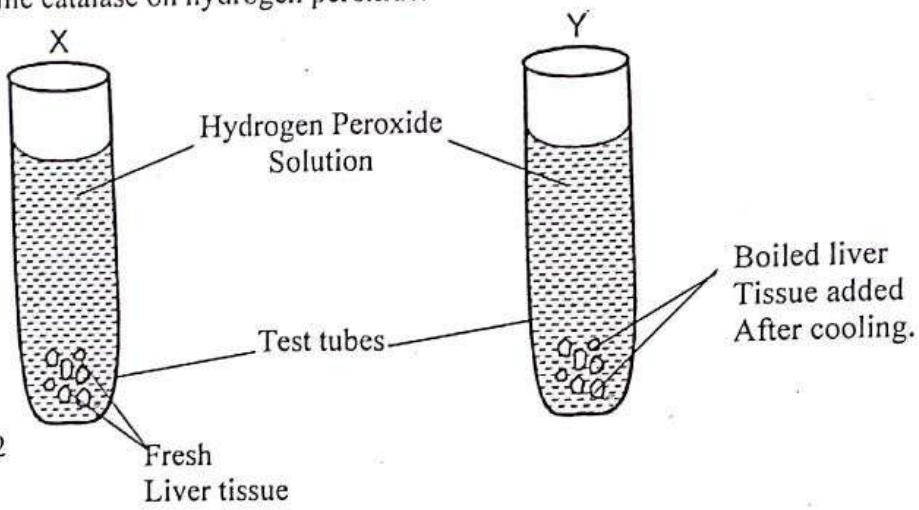
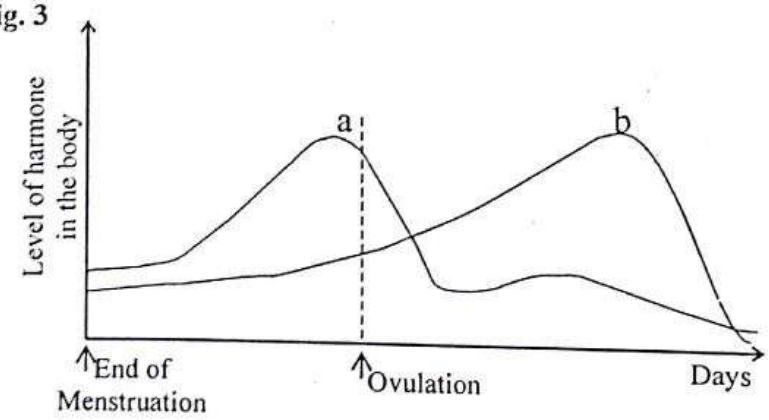


Fig 2

Which one of the following observations would likely be made in the above experiment?
A. Bubbles of colourless gas are given off from test tube Y
B. Bubbles of a colourless gas are given off from test tube X
C. Effervescence seen in test tube Y
D. No effervescence seen in test tube X

30. Figure 3 below shows the hormonal interaction that occurs during the menstrual cycle of a human female?

Fig. 3



Hormones a and b are respectively;
A. Luteinising hormone and oestrogen
B. Oestrogen and progesterone
C. Progesterone and oestrogen
D. Luteinising hormone and follical stimulating hormone.

SECTION B (40MARKS)

- *Answer all questions in this section*
- *Answers must be written in spaces provided.*

31. In an experiment to investigate the effect of solute concentration of the external solution on osmosis, fresh Irish potato cylinders were used. The potato cylinders were trimmed to a uniform length and diameter of 30.00mm and 5.00mm respectively.

The potato cylinders were then placed in sucrose solutions of varrying concentration labelled as A, B, C, D and E in mol l^{-1}.

The potato cylinders were allowed to stand in the sucrose solutions for half an hour (30 minutes); after which they were removed and re-measured.
The results obtained are shown in the table 1 below.

Table of results.

Concentration of sucrose solutions (mol l^{-1})	Diameter of potato cylinders after 30 minutes (mm)	Length of potato cylinders after 30 minutes (mm)	Volume of potato cylinders at the start of the experiment (mm^3)	Volume of potato cylinders at the end of the experiment (mm^3)
A	6.50	33.00		
B	5.00	30.00		
C	4.00	37.50		
D	5.50	31.50		
E	4.50	28.50		

a) Calculate the volume of the potato cylinders at the start and end of the experiment. Record your results in the table.

(Take volume of a cylinder = $\pi r^2 h$, take $\pi = \frac{22}{7}$)

b) Explain the difference in the volume of the potato cylinders at the end of the experiment for each of the following:

(i) Cylinder from solution A and D, (3mks)

.....

.....

.....

.....

.....

.....

.....

.....

(ii) Cylinders from solution C and E. (3mks)

.....

.....

.....

.....

.....

.....

c) Explain the result obtained for the cylinder from solution B. (2mks)

.....

.....

.....

.....

.....

.....

.....

d) State the biological importance of the results obtained in the experiment above. (05mks)

.....

.....

.....

.....

.....

.....

.....

.....

e) Apart from the tissue used in the experiment above name any two other tissues which can be used to obtain similar results. (2mks)

.....

.....

.....

.....

.....

.....

.....

32. a) What is meant by the following terms?

(i) Ecosystem.....

.....

.....

.....

(2mks)

(ii) Population.....

.....

.....

.....

(1mk)

(iii) Producer. .....

.....

.....

.....

(1mk)

b) i) Explain why Biological control is more suitable than chemical control in regulating pest population? (4mks)

.....

.....

.....

.....

.....

(ii) Name two organisms that can be used to study biological control in an aquatic environment.

.....

.....

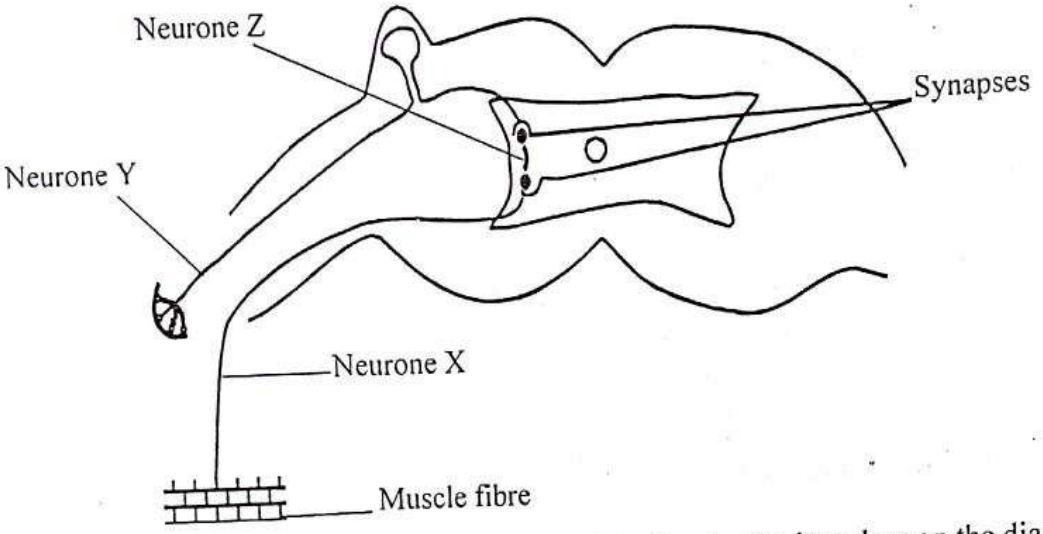
.....

.....

.....

(1mk)

33. Figure 4 below shows a representation of part of a reflex arc.



(a) By means of arrows show the direction taken by the impulses on the diagram.

(b) Name the neurones labelled.

X .....

Y.....

Z .....

($1^1/_2$mk)

c) State;

i) The structural differences between neuron X and Y (4mks)

Neurone X	Neurone Y

(ii) State one importance of a synapse in impulse transmission. (1mk)

.....

.....

d) Give two examples of a reflex action, (2mks)

.....

.....

.....

SECTION C (30MKS)

- Attempt any two (2) questions from this section.

34. a) Describe the events that result into the union of female and male gametes in a flowering plant. (12mks)

b) Suggest any three benefits of sexual reproduction over asexual reproduction in plants. (03mks)

35. a) Define
(i) Mutation (2mks)
(ii) Bivalency (2mks)

b) Janet, a member of the science club has blood group **A**. she was later proved pregnant, gave birth to a baby with blood group **O**. On serious accusation, she named Jacob a fellow student as being responsible for the pregnancy but Jacob denied responsibility. The case was then taken to court and the following facts were obtained.
- Jacob was found to be heterozygous for blood group **B**.

i) Using the test crosses, show whether Jacob's blood group corresponds to that of the baby (9mks)

ii) State whether the above test cross can prove parentage. Give a reason for your answer. (2mks)

36. a) Define
(i) Denitrification (2mks)

(ii) Complete fertilizer (2mks)

b) Describe an experiment to determine air content of a soil sample (7mks)

c) To 500cm^3 of soil in a measuring cylinder, 200cm^3 of water was added. It was stirred thoroughly and the final volume of the soil was 650cm^3
Calculate;

(i) the volume of air that existed in the soil sample (2mks)

(ii) the percentage of air in the soil. (2mks)

37.a) (i) Explain how ultrafiltration and selective reabsorption result into formation of hypertonic urine in mammals. (10mks)

(ii) Describe an experiment you would carry out to test for the presence of glucose in the urine of a person with malfunctioning kidneys. (05mks)

-END-

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

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

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2011
$2^{1}/_{2}$ hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- Answer **all** questions in sections **A** and **B**, and any **two** questions from section **C**
- Answers to section A should be written in the boxes provided.
- Answers to section B, should be written in the spaces provided.
- Answers to section C should be written on the answer sheet provided.

For Examiner's use only

Section		Marks	Examiner's Initials
A			
B	No. 31		
	No. 32		
	No. 33		
C	No.		
	No.		
Total			

Turn Over

SECTION A (30MARKS)

1. Which one of the following food substances are believed to contain no energy value?
   A. Fats
   B. Vitamins
   C. Carbohydrates
   D. Proteins.

2. Some women become infertile because their ovaries fail to develop the graafian follicles needed to release ripe ova into their reproductive systems. This is because the pituitary gland failed to produce…
   A. FSH
   B. LH
   C. Oesterogen
   D. Thyroxine

3. Which **one** of the following parts of the brain is responsible for regulation of blood pressure?
   A. Cerebellum
   B. Medulla oblongata
   C. cerebrum
   D. Grey matter

4. A certain plant has the following characteristics;
   i) Has soft fleshy stem
   ii) Has large flattened leaves
   iii) Has numerous stomata
   Such a plant is commonly found in;
   A. Water logged environment
   B. Desert
   C. Forests.
   D. canopy

5. During unfavourable conditions, by which of the following methods does the amoeba reproduce?
   A. Binary fussion
   B. Binary fission
   C. Multiple fussion
   D. Multiple fission

6. Insects and worms are the main diet of most toads. This means that toads are;
   A. Carnivorous
   B. Insectivorous
   C. Amphibians
   D. Herbivorous.

7. A policeman stretched out his arm to the right to guide smooth flow of vehicles. To cause this motion of the arm his…
   A. biceps contracted while the triceps relaxed
   B. triceps contracted while biceps relaxed
   C. biceps and triceps both relaxed
   D. triceps and biceps both contracted.

8. The principle function of Anaphase I of meiosis is to enable…
   A. Homologous chromosomes form chiasmata
   B. Homologous chromosomes lie on equator of spindle.
   C. Homologous chromosomes separate and move towards opposite poles.
   D. Chromatids migrate to the poles of the spindle.

9. Which one of the following best describes the function of the Umblical cord? It ..
   A. feeds the embryo with digested food substances.
   B. conveys nutrients and wastes to and from the embryo respectively.
   C. removes waste matter from the embryo to the mothers blood.
   E. supplies oxygenated blood from the mother to the embryo.

10. A certain plant species was investigated by Biology students and it was found that the upper leaf surface had more stomata than the lower surface. Which of the following could be the likely habitat for the plant species?
A. Hot desert
B. Open grassland
C. Aquatic habitat
D. Open forest

11. The rate of flow through the renal artery was found to be $1200cm^3$/min, the Urea concentration in the renal artery was $32mg/100cm^3$. If the flow rate of blood remained constant, determine the quantity of Urea removed from the kidney in one hour.
A. 96mg
B. 576mg
C. 5760mg
D. 11520mg.

12. Which one of the following digestive juices depends on hormone secretion for its release?
A. Saliva
B. Gastric Juice
C. Pancreatic Juice
D. Intestinal juice.

13. The muscular energy used by Tom while climbing up a mango tree originates from the sun. Which of the following is the correct sequence in which energy has been transformed?
i) Digestion of starch in Tom
ii) Depostion of starch in the Mango
iii) Tissue respiration in Tom's Muscles.
iv) Synthesis of sugar in a leaf.
A. (iv), (i), (iii), (ii).
B. (ii), (iv), (i), (iii).
C. (iv), (ii), (i), (iii).
D. (i), (iv), (ii), (iii).

14. In an experiment to find out the effect of water on germination, the sets below were put up. In which of these sets did the seeds germinate but quickly died off.
A. Seeds soaked for 48 hours on wet cotton wool.
B. Seeds soaked for 48 hours on dry cotton wool.
C. Dry seeds on dry cotton wool.
D. Dry seeds on wet cotton wool.

15. Which of the following lives on land but has aquatic larva stage?
A. Mosquito
B. Snake
C. Dragon fly
D. Snail.

16. Which of the following factors is NOT required by all bacteria for growth?
A. Food
B. water
C. Minerals
D. Oxygen

Turn Over

30. Three funnels P, Q and R were plugged with cotton wool at their bases and were then filled to the same level with loam, clay and sandy soil. Then 500cm^3 of water was added into each of these funnels.
The filtrates collected at the end of thirty minutes were as follows;
P- 450cm^3, Q- 300cm^3 and R – 400cm^3 which funnel(s) contained clay soil?
A. R B. Q C. P D. Q and R.

SECTION B (40MARKS)

- ***Attempt all questions in this section***

31. a) In an experiment to investigate the rate of enzyme activity, three extracts of fresh plant materials were mixed with a fixed concentration of hydrogen peroxide solution in 10ml measuring cylinders, labeled 1, 2 and 3. The volume of the mixtures including froth (foam) were read and recorded every 20 seconds for 60 seconds.
The results obtained are as shown in the table below.

The potato cylinders were allowed to stand in the sucrose solutions for half an hour (30 minutes); after which they were removed and re-measured.
The results obtained are shown in the table 1 below.

Time(s)	Volume of mixture with extract 1 (cm^3)	Volume of mixture with extract 2(cm^3)	Volume of mixture with extract 3(cm^3)
0	5.0	5.0	5.0
20	5.2	5.3	5.4
40	5.4	5.6	6.0
60	5.6	6.0	9.2

On the same axes, plot graphs on the graph paper provided for the volume of mixtures 1, 2, 3 (on the y) axis) with time (on the x-axis). (09 marks).

(Insert graph paper)

31. b) Using your graph calculate the rate of reaction $\left(\frac{\text{Change in volume}}{\text{Change in time}}\right)$ in cm^3 per second between 20 and 40 seconds for the reaction with each extract. (06 marks).

(i) rate with extract 1.

.....

.....

.....

.....

.....

.....

(ii) rate with extract 2.

.....

.....

.....

.....

.....

(iii) rate with extract 3.

.....

.....

.....

.....

.....

c) Explain the results for the rate of reaction in (b) above. (3mks)

.....

.....

.....

.....

.....

.....

d) Besides the factor being investigated in the experiment state any **three** other factors that may affect an enzyme activity. ($01\frac{1}{2}$mks)

.....

.....

.....

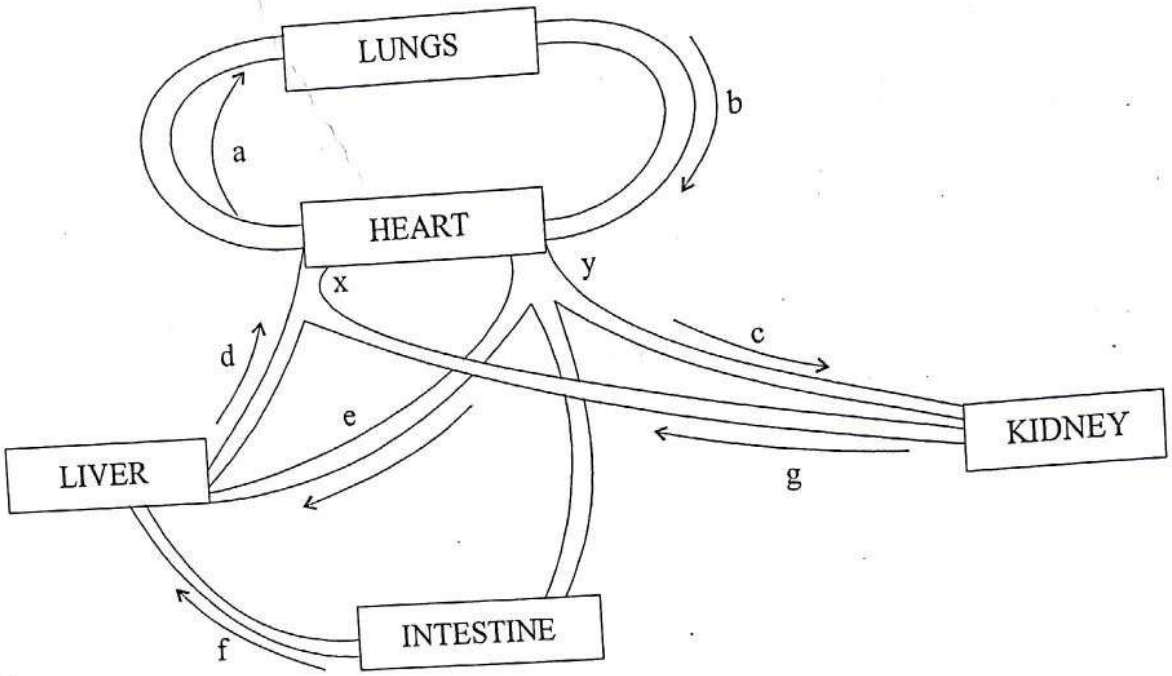
Turn Over

e) Suggest the identity of the enzyme whose action has been investigated in the above experiment.
($^1/_2$mk)

.....

.....

2. Figure 3 below represents blood vessels supplying selected organs. The arrows show the direction of blood flow.



(3mks)

a) Name the vessels labeled a to f

a .....

b .....

c .....

d .....

e .....

f .....

b) State the differences in composition of blood in vessels;

i) c and g (02mks)

.....

.....

.....

ii) a and b (01mk)

.....

.....

.....

.....

(02 mks)

iii) d and f

.....

.....

.....

.....

.....

c) Explain the difference in blood pressure in blood vessels x and y . (02 mks)

.....

.....

.....

.....

.....

33. a) What is meant by the following terms as applied to wild life in a game park?

i) Game cropping (01mk)

.....

.....

.....

ii) Carrying capacity (01mk)

.....

.....

.....

b) In an ecological study it was observed that organism A feeds on green plants, while C feeds on A, B feeds C and that D feeds on B. If all the letters A, B, C and D represent living organisms in an ecosystem, which organism is; (03mks)

i) Producer

.....

.....

Turn Over

ii) Secondary consumer

.....

.....

iii) Tertiary Consumer

.....

.....

iv) Draw a pyramid of numbers using the data above. (01mk)

.....

.....

.....

.....

.....

.....

c) In a practical experiment to determine the population of rats in the neighbouring bush at John's school, 75 rats were captured, marked and released.
After 2 days, a second capture of 200 rats was made. It was observed that in the second capture 150 of them had not been captured before.

i) Identify the method used to determine the population of rats in this experiment. (01mk)

.....

.....

ii) Calculate the population of rats in the bush next to John's school. (03mks)

.....

.....

.....

.....

SECTION C (30MKS)

- Attempt any two (2) questions from this section.

34. a) i) What is meant by the term pollution? (01mk)
ii) Outline any four common air pollutants. (02mks)

b) Describe the human activities that would lead to less production of carbon dioxide into the atmosphere. (12mks)

35. a) i)What is meant by the term Mutation? (01mk)

(ii) Give any four agents of Mutations. (02mks)

b) How has the knowledge of genetics helped in improving plant breeds? (04mks)

c) Sickle cell anaemia is a condition in humans where red blood cells attain sickle-shapes. A normal man married a woman who is a carrier of sickle cell-trait. Carry out test crosses to determine the genotypic ratio of the likely off springs. (08mks)

36. a) Outline the factors which affect the rate of photosynthesis. (05mks)

b) Describe an experiment to show that light is necessary for photosynthesis. (10mks)

37. a) What is seed and fruit dispersal? (02mks)

b) Describe how seeds and fruits are adapted to their different methods of dispersal. (13 mks)

-END-

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

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

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2013
$2^1/_2$hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consist of* **three** *sections;* **A, B** *and* **C**
- *Answer* **all** *questions in sections* **A** *and* **B,** *and any* **two** *questions in section* **C.**
- *Answers to section* **A** *should be written in the boxes provided.*
- *Answers to section* **B** *should be written in the spaces provided.*
- *Answers to section* **C** *should be written on the answer sheets or in answer booklets provided.*

For Examiner's use only

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

SECTION A (30MARKS)

Answer all questions in this section. Write the letter representing the most correct answer to each question in the box provided.

1. Which one of the following gases is in large percentage by composition in the exhaled air?
   A. Carbon dioxide
   B. Nitrogen
   C. Oxygen
   D. Water vapour

2. A certain nerve cell has the following characteristics;
   i) Short dendrons
   ii) Long axon
   iii) Terminal cell body
   It is likely to be;
   A. Motor neurone
   B. Sensory neurone
   C. Relay neurone
   D. Reflex arc

3. A certain plant posses broad leaves, green stem and less developed roots. Such a plant is likely to be found in a ;
   A. Desert
   B. Wetland
   C. Lake
   D. Hilly area

4. The following results were obtained by a scientist who crossed the F_1 generation of pure breeding parents for round and wrinkled seeds.

Dominant	Recessive trait	Number of F_2 off spring.
Round seeds	Wrinkled seeds	7,524

From the results it can be concluded that the actual number of round seeds he obtained was;
   A. 1881
   B. 22572
   C. 2508
   D. 5643

5. Binary fission describes the type of reproduction where the organism divides to form;
   A. Many spores
   B. Two daughters
   C. Many buds
   D. Numerous rhizomes

6. Which one of the following animals is likely to have a longer gestation period?
   A. Man
   B. Rabbit
   C. Elephant
   D. Guinea pig

7. Skeletal muscles are usually found in opposing pairs because;
   A. This gives greater strength than single muscles would provide.
   B. Muscles can only work by contraction.
   C. One muscle alone cannot bend a joint.
   D. One muscle alone cannot extend a joint.

8. Which of the following in NOT an adaptation of the ileum to absorption of products of digestion?
   A. Presence of very many villi.
   B. Being very long.
   C. It is between duodenum and colon.
   D. Has thin epithelium.

9. The hormone secretin stimulates the release of
   A. Bile
   B. Gastric juice
   C. Succus entericus
   D. Pancreatic juice

10. The main advantage brought about by chromosomes crossing over during **prophase I** of meiosis is?
   A. Genetic variation.
   B. Formation of four daughter cells
   C. Sex linkage
   D. Cell entering into metaphase I.

11. When one enters a dark room, he is able to see clearly after sometime. This is due to the presence of.....in the eyes.
   A. Cones
   B. Rods
   C. Retina
   D. Blind spot

12. The following hypothetical results were obtained by a student trying to determine the percentage of air in a given sample of soil.

- Volume of soil sample = Acm^3
- Volume of soil + water before stirring = Bcm^3
- Volume of soil + water after stirring = Dcm^3

The percentage of air contained in the soil sample is;

A. $\frac{D}{A}$ X 100%

B. $\frac{(D - B)}{A}$ X 100%

C. $\frac{B}{A}$ X 100%

D. $\frac{(D - A)}{B}$ X 100%

13. Under which of the following sets of conditions will seeds germinate?

	Temperature	Light	Water	Oxygen
A	20^0C	Absent	Present	Present
B	20^0C	Present	Absent	Present
C	0^0C	Present	Present	Present
D	20^0C	Present	Present	Absent

14. The rate of flow of blood through the renal artery was found to be $1200cm^3$/ min. The urea concentration in the renal artery was $32mg/100cm^3$ and in the renal vein $24mg/100cm^3$ remained constant, determine the quantity of urea removed from the kidney in one hour.

A. 96 mg
B. 576 mg
C. 5760 mg
D. 11520 mg

15. If a man of blood type **A** married a woman of blood type **B** and they have a child of blood type **AB**, which one of the following statements is true;

A. No blood transfusion between members of the family are possible.
B. The mother could donate blood to the father but not to the child.
C. The child could receive blood from the father and mother.
D. The child could donate blood to the father and the mother.

16. Which of the following vitamins is believed to be water soluble?
A. K
B. E
C. B
D. A

17. In which of the following processes does the largest amount of nitrogen get removed from the mammalian body?
A. Breathing
B. Sweating
C. Urinating
D. Defecating

18. The role of hydrochloric acid added to the solution when testing for non – reducing sugar is to;
A. Neutralize the solution
B. Provide suitable medium for action of Benedicts' solution
C. Hydrolyse the non – reducing sugar
D. Kill the germs in the solution

19. Which one of the following layers of the skin is responsible for formation of new skin cells?
A. Malphigian layer
B. Conified layer
C. Granular layer
D. Dermal layer

20. The table below shows surface areas and volumes of four different animals. Which of them would most need a transport system?

Animal	Surface area (cm^3)	Volume (cm^2)
A	1120	1110
B	30	20
C	84	21
D	50	100

21. 120 beetles were collected, marked and released back into a compound. A few days later 120 beetles were collected from the same compound and 30 of them carried the mark.

The estimated number of beetles in the compound is;

A. 240
B. 360
C. 480
D. 560

22. Lateral roots originate from;

A. Endodermis
B. Epidermis
C. Pericycle
D. Cambium

23. Organism X has the following characteristics

i) Body temperatures = 29°c
ii) Number of limbs = 8
iii) Head and thorax are fused
iv) Feeds on dead animals
v) Is nocturnal

Which of the following combinations of characteristics would be useful in making a dichotomus key?

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

24. The process by which cells become modified and then perform specific functions in an organism is referred to as;

A. Cell division
B. Tissue formation
C. Cell differentiation
D. Cell duplication

25. Which one of these environmental factors does not affect the rate of photosynthesis directly?

A. Light intensity
B. Temperature
C. Carbon dioxide concentration
D. Oxygen concentration

26. Which one of the following processes facilitates movement of solid materials inside an amoeba cell?

A. Pinocytosis
B. Phagocytosis
C. Exocytosis
D. Endocytosis

27. Which one of the following method is most suitable for collecting grass hoppers?
A. Light traps
B. Sticky traps
C. Pit fall traps
D. Sweep netting

28. The following are parts of the inner ear of man;
i) Semi – circular canals
ii) Organ of corti
iii) Utriculus
iv) Sacculus

Which one of the following sets of parts are concerned with balanced of the body?
A. (i), (ii) and (iii)
B. (i), (iii) and (iv)
C. (ii), (i) and (iii)
D. (ii), (iv) and (iii)

29. Which one of the following is the most effective method of preventing spread of HIV/ AIDS?
A. Use of condoms
B. Circumcision
C. Use of ARVs
D. Use of pills

30. Which of the following is the effect of disposal of plastic materials in the soil?
A. Improves soil drainage
B. Improves soil texture
C. Decreases soil drainage
D. Decreases soil organisms

SECTION B (40marks)

Answer all questions in this section. Answers must be written in the spaces provided.

31. A biologist undertook study on a human being and monitored its general body growth rate and some of the systems there in overtime. Sophisticated biological equipments were used to monitor nervous and reproduction systems. The graphs drawn depict the results obtained. Study them and answer questions that follow.

Graphs showing percentage of general body growth, nervous and reproductive systems in relation to adult size over time.

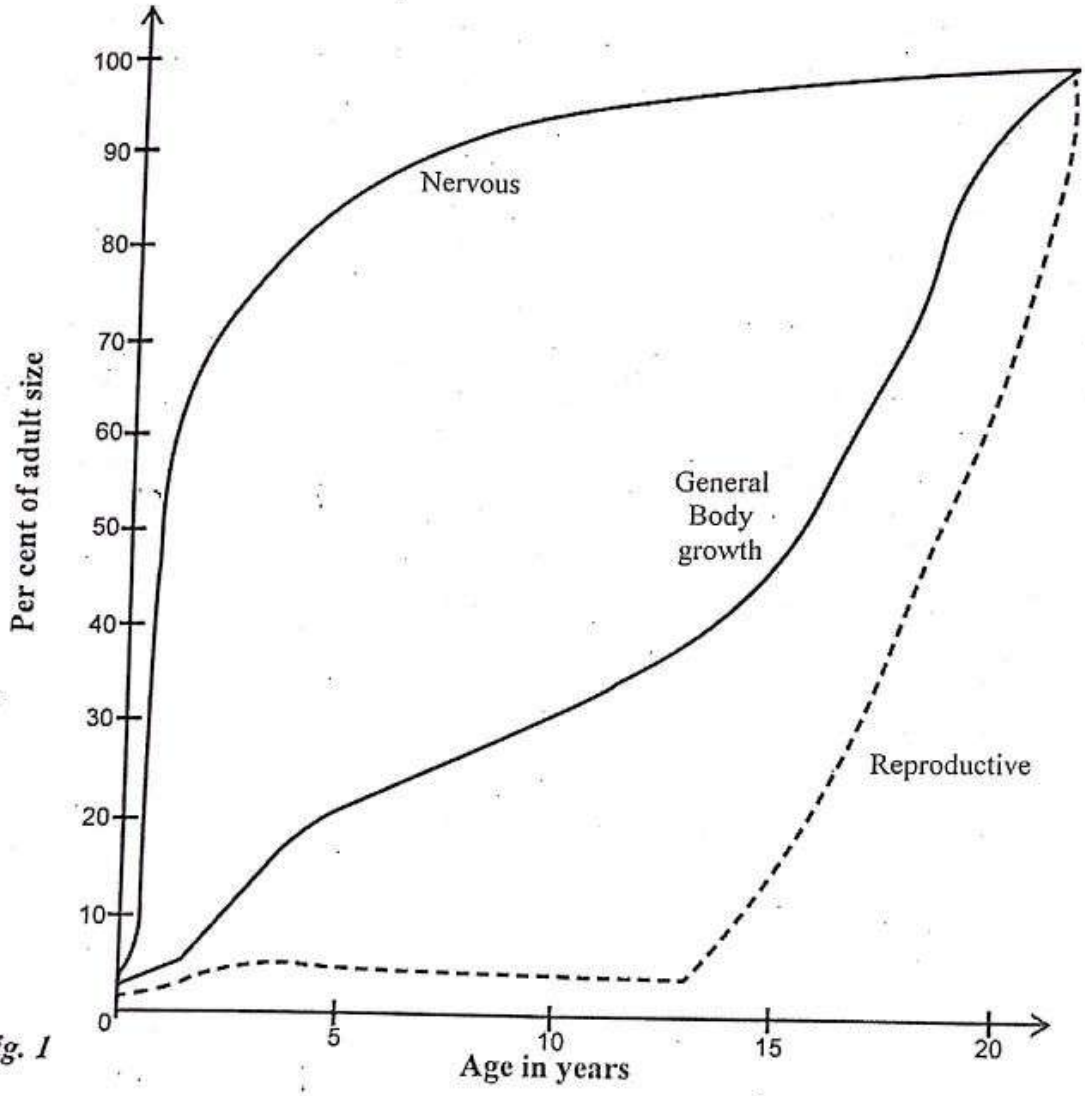


Fig. 1

a) From the graph, in fig (1) above describe how the general body growth in relation to adult size behaved over time. (5 marks)

b) (i) Explain why the reproductive system showed the trend as observed from the graph. (3 marks)

(ii) Mention any two (2) chemicals in man that could have contributed to the behavior of reproductive curve after 13 years. State one role of each. (4 marks)

Name	Role

c) Explain the behavior of the nervous system curve over the years. (4 marks)

d) i) There are two known growth areas in plants. They have specific functions. Name them and state one function of each. (3 marks)

Name	Role

ii) State the type of cell division the plant cells undergo in the growth areas. (1 mark)

32. a) Name two types of dentition known to exist in mammals. (1 mark)

_____

_____

b) The diagram in fig 2 below shows a section through a tooth of mammal. Study it and answer the questions that follow.

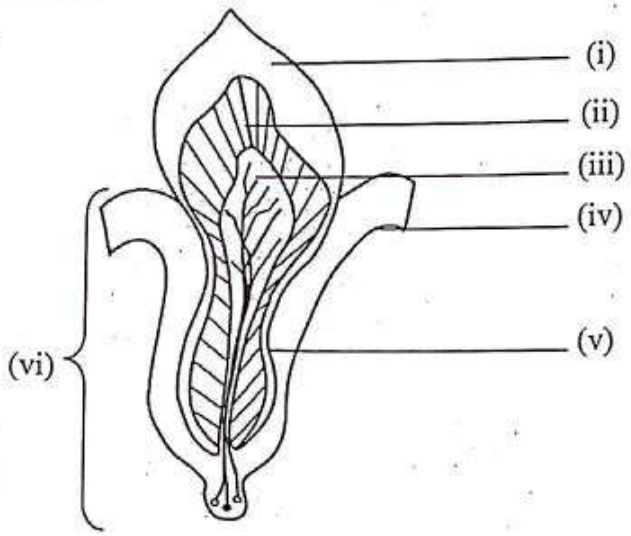


Fig. 2

b) Name the parts labeled (3 marks)

i) _____

ii) _____

iii) _____

iv) _____

v) _____

ii) State the functions of part labeled (iii). (1 mark)

_____

c) State the type of digestion performed by the teeth, in mammals.

(1 mark)

_____

d) Explain what would happen to a carbohydrate laden food sample the moment it reaches in the region where the above structure is found. (3 marks)

_____

_____

_____

_____

33. a) Define the term Osmosis. (3 marks)

b) The set up in figure 3 below was used to study the process of osmosis. Study it and answer questions that follow.

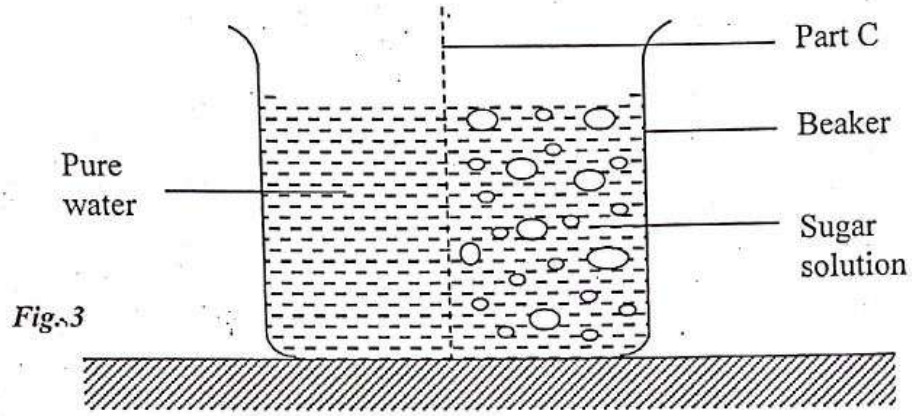


Fig. 3

i) Part labeled C enabled the process of osmosis to take place. Give the probable name of the part labeled C found in an animal. (2 marks)

ii) If the set up was left to stand for 3 hours, explain what would be observed. (2 marks)

c) Explain what would happen to a red blood cell if it was placed in a petri dish containing pure water. (3 marks)

d) Name one organ with in a mammalian body where you would expect the highest process of osmosis to take place. (1 mark)

SECTION C (30 MARKS)

Answer any two questions from this section. Additional answers will not be marked. Answers to this section are to be written in the answer booklets provided.

34. a) Outline four roles played by living things in the soil. (04 marks)

b) Describe an experiment to show that soil contains living organisms. (11 marks)

35. a) State three exclusive features of class insect. (03 marks)

b) Describe the various adaptations of insects for locomotion. (12 marks)

36. a) Explain the sequence of events which occurs in mammals during

i) Fertilization

ii) Child birth

b) What are the advantages of having a foetal circulatory system separated from that of the mother? (03 marks)

37. a) What do you understand by the term water pollution? (02 marks)

b) Describe the human activities that lead to water pollution. (13 marks)

- END -

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

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

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2014
$2^{1}/_{2}$hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consist of* **three** *sections;* **A, B** *and* **C**
- *Answer* **all** *questions in sections* **A** *and* **B,** *and any* **two** *questions in section* **C.**
- *Answers to section* **A** *should be written in the boxes provided.*
- *Answers to section* **B** *should be written in the spaces provided.*
- *Answers to section* **C** *should be written on the answer sheets or in answer booklets 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 A (30 MARKS)

- **Answer all questions in this section.**
- **Write the letter representing the most correct answer to each question in the box provided.**

1. Four test tubes were filled with pond water prepared as shown below, then placed in bright light.

Tube A	Tube B	Tube C	Tube D
Pond weed, 25^0C	Pond weed, water snail, 25^0C.	Pond weed, 10^0C	Pond weed, tube enclosed in aluminium foil, 25^0C

Which one of the tubes would produce most oxygen?

A. D
B. C
C. B
D. A

2. The radicle of a seedling is able to bend down wards in search for water mainly because;
   A. Auxins concentrate in the lower side causing this region to elongate.
   B. Auxins concentrate in the upper side causing this region to elongate.
   C. Auxins concentrate in the lower side causing this region to grow slowly.
   D. Auxins concentrate in the upper side causing the region to grow slowly.

3. Messages across a synapse is by means of?
   A. Chemical reaction.
   B. Impulse.
   C. Mechanical reaction.
   D. Electrical means.

4. Light from a far object converges at a point behind the retina of the eye. This causes a blurred image. Such a defect is corrected by;
   A. Wearing a diverging lens.
   B. Wearing a converging lens.
   C. Wearing glasses.
   D. Eating food rich in vitamins.

5. Hypertitis B has been rampant and killing some people in Karamoja. What has been the likely cause of the disease?
   A. Poor sanitation.
   B. Poor feeding.
   C. Lack of feeding.
   D. Drinking raw blood.

6. Seeds from bean pods are able to be dispersed through explosive mechanism because the pods.
   A. Split open when they are dry.
   B. Contain lines of weakness.
   C. Are forced to open due to enlargement of the seeds.
   D. Contain edible seeds.

7. Which one of the following is a hereditary disease?
   A. HIV/AIDS.
   B. Meningitis.
   C. Haemophilia.
   D. Ricket.

8. Which one of the following processes is responsible for the destruction of Ozone layer?
   A. Massive cutting down of trees.
   B. Burning of polythene bags.
   C. Release of carbon dioxide gas.
   D. Release of CFCs.

9. A prickly pear is a succulent plant with broad, flat stems, having leaves in form of spines. Such a plant is likely to be found in a;
   A. Water deficient area.
   B. Water logged area.
   C. Hilly area.
   D. Low land.

10. In a certain food web, toads feed on insects, while the insects feed on green plants. At the same time hawks feed on the toads. We can therefore conclude that insects are;
   A. Primary consumers.
   B. Primary producers.
   C. Secondary consumers.
   D. Tertiary consumers.

11. A certain patient was found to be able to receive blood from anybody who was willing to donate blood during blood transfusion. Which one of the following blood groups is likely to be that of the patient?
   A. O
   B. A
   C. B
   D. AB

12. In some cultures, pregnant women are encouraged to eat structures made of soil components. This is to;
   A. enable foetus grow well.
   B. enable strengthening of mother's bones.
   C. enable pregnant women get extra iron.
   D. stop mothers from vomiting.

13. The process of meiosis in living organisms is very important during;
   A. Growth of living organisms.
   B. Formation of gametes.
   C. Cell division.
   D. Cell rejuvenation.

14. When water was poured in a sample of soil placed in a funnel in a laboratory, water quickly run through and collected in a beaker placed under the funnel. This means that soil has;
    A. High capillarity.
    B. Small air spaces.
    C. Low capillarity.
    D. High water retention capability.

15. Extended fallow system practiced by farmers is to ensure that;
    A. More nitrogen is fixed in the soil.
    B. Soil erosion is controlled.
    C. Land is available for the next planting season.
    D. Better yields are realized in the piece of land.

16. When it is very hot, dogs often pant. This is because;
    A. They use the mouth to breath.
    B. Sweat glands are absent.
    C. They expose their teeth when hot.
    D. They are carnivorous.

17. In an experiment to determine the percentage of air in the soil, the following results were obtained.
    Volume of water used. ..... $600cm^3$
    Volume of water + soil before stirring .....$850cm^3$
    Volume of water + soil after stirring .....$750cm^3$
    What is the percentage of air in the soil sample?
    A. 13.33%
    B. 16.67%
    C. 11.76%
    D. 40.00%

18. Which one of the following is the most effective process responsible for absorption of mineral salts by the root hairs?
    A. Osmosis.
    B. Diffusion.
    C. Active up take.
    D. Capillarity.

19. An individual was found to experience prolonged bleeding after having an injury. Which one of the following vitamins is likely to be lacking in that individual?
    A. Vitamin D.
    B. Vitamin K.
    C. Vitamin B6.
    D. Vitamin B12.

20. The following reagents are used to test for food substances.
    (i) Iodine solution.
    (ii) Dilute hydrochloric acid.
    (iii) Copper (II) Sulphate solution.
    (iv) Dilute Sodium hydroxide.

Which pair of the above reagents are used to test for proteins in a food extract?
A. (i) and (ii)
B. (ii) and (iv)
C. (iii) and (iv)
D. (i) and (iv)

21. Which one of the following is an example of tropism?
A. Withdraw of woodlice from light.
B. Bending of mimosa plant on touch.
C. Withdraw of housefly larva from light.
D. Growing of a bean root towards water.

22. Which one of the following is a photosynthetic protozoa?
A. Plasmodium.
B. Trypanosome.
C. Euglena.
D. Paramecium.

23. The table shows surface area and volume of four different animals. Which of them would most need a transport system?

Animal	Surface area (cm^2)	Volume (cm^3)
A	1120	1110
B	30	20
C	84	21
D	50	100

24. Below are mechanisms by plants to promote cross pollination, except
A. Homogamy.
B. Protandry.
C. Protagyny.
D. Self sterility.

25. A student looked through a microscope and found that it was dark. Which part of a microscope would a student adjust to proceed with the use of microscope?
A. Fine adjustment.
B. Diaphragm.
C. Stage.
D. Eye piece lens.

26. Which one of the following is the main form of the photosynthetic product transported through phloem?
A. Starch.
B. Amino acids.
C. Sucrose.
D. Glucose.

27. Which of the following sets of characteristics comprise only characteristics of discontinuous variation?
A. Tongue rolling, blood groups, sex.
B. Height, body weight, intelligence.
C. Colour blindness, skin colour.
D. Skin colour, height, albinism.

Turn Over

28. To which one of the following bones is the biceps muscle attached by tendons?
    A. Scapula and radius.
    B. Humerous and radius.
    C. Scapula and Ulna.
    D. Humerus and ulna.

29. The most likely habitat for a plant with many stomata on the upper surface of its leaves is
    A. Desert.
    B. Salty marsh.
    C. High attitude.
    D. Water.

30. While carrying out field work, students collected animals with the following characteristics.

Animal A	Animal B
4 pairs of walking legs	A pair of compound eyes
Simple eyes	3 pairs of walking legs
2 body parts	1 pair of antennae
	3 body parts

Animal A and B belong to the same;
A. Class.
B. Phylum.
C. Species.
D. Genus.

SECTION B (40 MARKS)

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

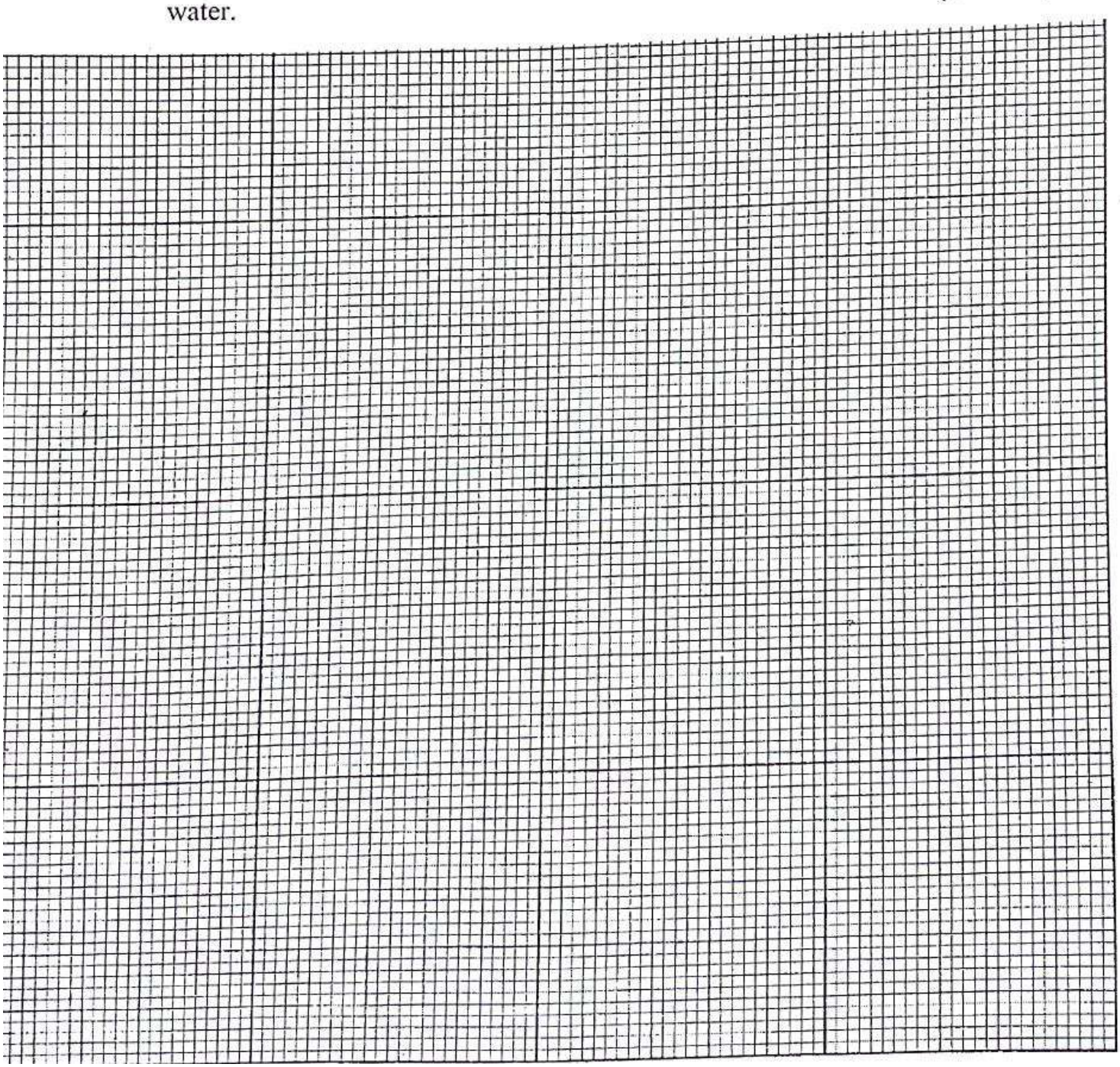
Answers should be written in the spaces provided.

31. An experiment was done with a protozoan living in the sea. The animal forms a contractile vacuole. The number of times contractile vacuole forms and discharged in a period of ten (10) minutes was recorded when the protozoa was placed in sea water with varying concentrations.

The results obtained were as in the table below.

Number of times the vacuole forms.	13	11	10	8	5	4	3	2	1	0
Percentage of salt in Sea water.	1.0	1.3	1.5	1.9	2.3	2.7	3.4	3.9	4.7	4.9

(a) Using the results in the table above, draw a graph showing variation of number of times the vacuole forms in ten minutes with the percentage of salt in sea water. (09 marks)



(b) Using the graph drawn in (a), determine the percentage of salt in sea water that will enable the protozoan form six (6) vacuoles in ten minutes. (01 mark)

.....

(c) State the relationship present between the concentration of sea water and the number of times vacuole forms in ten minutes. (02 marks)

.....

.....

.....

(d) Explain the relationship stated in (c) above. (04 marks)

.....

.....

.....

.....

.....

.....

(e) Explain what would happen to the protozoan if it was placed in sea water whose percentage of salt was 6.5 for 1 hour. (02 marks)

.....

.....

.....

.....

(f) State any two substances the contractile vacuole removes from a protozoan. (02 marks)

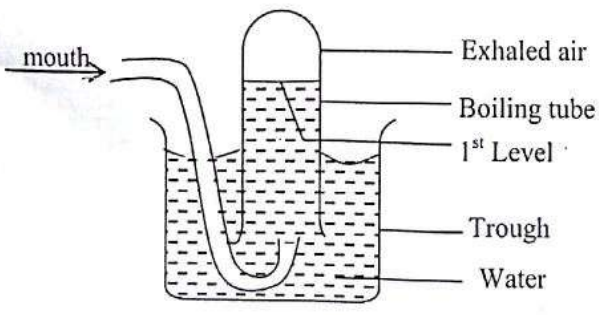
.....

.....

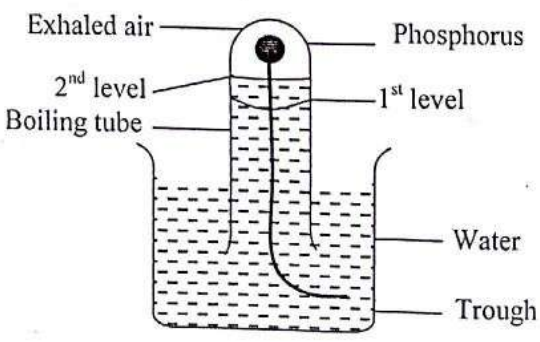
.....

32. The following set up was used to study whether exhaled air contain oxygen.

Set up A



Set up B



(a) i) State one reason why the level of water in setup B rose from 1st level to 2nd level. (02 marks)

.....

.....

.....

ii) Name the process that took place in set up B (01 mark)

.....

.....

.....

(b) How would you test for presence of oxygen in exhaled air in the laboratory? (02 marks)

.....

.....

(c) Explain the circumstances under which exhaled air contains oxygen gas. (02 marks)

.....

.....

.....

.....

(d) Outline any three characteristics possessed by surfaces within the lungs that enable oxygen in the inhaled air enter the blood capillaries. (03 marks)

.....

.....

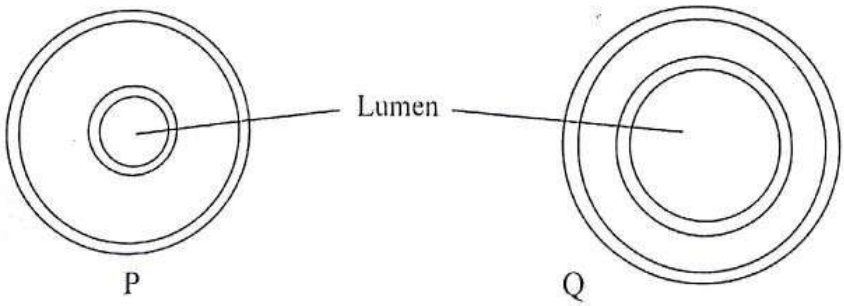
.....

.....

.....

.....

33. Study the structures of two blood vessels P and Q below, (drawn to the same scale).



(a) With two reasons in each case, identify vessels P and Q. (02 marks)

i) Vessel P

Identity: .....

Reasons; .....

.....

(02 marks)

ii) Vessel Q

Identity: .....

Reasons; .....

.....

(b) Suggest two importance of the features of blood vessels P and Q shown on the diagrams

i) Vessel P: (02 marks)

.....

.....

.....

.....

.....

ii) Vessel Q: (02 marks)

.....

.....

.....

.....

.....

(c) Explain the importance of the structure of the left ventricles of the heart. (02 marks)

.....

.....

.....

.....

SECTION C (30 MARKS)

Attempt any **two** *questions in this section.*

34. a) Giving two examples in each case, Explain what is meant by the following terms.
    (i) Sporulation (03 marks)
    (ii) Binary fission (03 marks)

    b) State any three differences between conjugation and sporulation. (03 marks)

    c) During menstrual cycle in human female, pituitary gland secretes two hormones called gonadotrophins. Give the names of the hormones and their effects. (04 marks)

    d) Name any two diseases which affect the reproductive system in humans. (02 marks)

35. a) Define the following terms. (05 marks)
    (i) A gene.
    (ii) Mutagen.
    (iii) Genotype
    (iv) Sex linked genes.
    (v) Chromosome.

    b) During some experiments in genetics a scientist wanted to determine the type of off springs that would be produced in the second generation. Considering the length of stems in plants, work out the type of off springs that would be produced in the second generation, if pure breeding tall pea plants were crossed with pure breeding short pea plants, and the off springs of the first generation self crossed. (Use appropriate defined symbols). (07 marks)

36. a) What is meant by the term placentation? (01 mark)

    b) With the aid of diagrams, describe the following types of placentation in fruits. (14 marks)
    (i) Marginal placentation.
    (ii) Axile placentation.
    (iii) Free central placentation.
    (iv) Parietal placentation.

37. a) Describe an experiment to show that a leaf exposed to light manufactures starch for the plant. (11 marks)

    b) State the modifications of leaves for any other functions. (04 marks)

- END -

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

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

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2015
$2^1/_2$hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consist of* ***three*** *sections;* **A, B** *and* **C.**
- *Answer* **all** *questions in sections* **A** *and* **B,** *and any* **two** *questions from section* **C.**
- *Answers to section* **A** *should be written in the boxes provided.*
- *Answers to section* **B** *should be written in the spaces provided.*
- *Answers to section* **C** *should be written on the answer sheets or in answer booklets 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 A (30 MARKS)

Answer **all** questions in this section. Write the letter representing the most correct answer to each question in the box provided.

1. An adaptation by plants to obtain nitrogen include all the following except.
   A. Mycorrhiza on plant roots
   B. Bacteria in root nodules
   C. Possession of aerial shoots
   D. Being insectivorous

2. Which one of the following is the correct route taken by blood on leaving the heart in a fish?
   A. Gills ⟶ body ⟶ heart
   B. Body ⟶ Gills ⟶ heart
   C. Gills ⟶ Heart ⟶ Body
   D. Body ⟶ Heart ⟶ Gills

3. The rapid elongation of the epicotyl during germination causes.
   A. delay in emergence of photosynthetic leaves.
   B. cotyledons to grow about the ground.
   C. early emergence of photosynthetic leaves.
   D. cotyledons to remain below the ground.

4. Which one of the following does not contribute to flight in birds?
   A. Quill feather
   B. Hollow bone
   C. Down feather
   D. Strong pectoral muscles.

5. The following are parts of a plant seed (i) Testa (ii) Plumule (iii) Radicle (iv) Micropyle (v) Cotyledon. Which of these parts play a role in protection of the embryo?
   A. (ii) and (iii)
   B. (i) and (v)
   C. (i) only
   D. (i) (ii) (iii) and (iv).

6. When lumps of soil for clay, loam and sand are rolled in hands, the ease with which they crumble is always in the reducing order as
   A. Clay, Sand, Loam
   B. Sand, Clay, Loam
   C. Sand, Loam, Clay
   D. Clay, Loam, Sand.

7. Four membranes P, Q, R and S were found to have average of 3, 4, 12 and 2 mitochondria respectively per cell. Which membrane is most likely to allow passage of materials by active transport?
   A. P
   B. Q
   C. S
   D. R

8. An organism has a cylindrical body, over 30 segments, two pairs of legs per segment and bears mandibles. To which class of arthropods would you place it?
A. Diplopoda
B. Insecta
C. chilopoda
D. Crustacean

9. When a unique plant structure was studied, it was found to possess buds, nodes and internodes. This can best be classified as a
A. leaf
B. root
C. flower
D. stem

10. The offsprings of a cross between short rooted radicle and long rooted radicle plants were found to always be oval rooted. This is an example of
A. incomplete dominance
B. mutation
C. complete dominance
D. crossing over.

11. Which pair of food stuffs provides energy during starvation?
A. Carbohydrates and Proteins
B. Carbohydrates and lipids
C. Lipids and proteins
D. Carbohydrates and vitamins.

12. A fruit has the following characteristics
(i) Air spaces,
(ii) Fibrous mesocarp
(iii) Spongy seed coat
Which one of the following is the main dispersal agent for the fruit?
A. Animals
B. Self mechanism
C. Wind
D. Water

13. Which of the following methods can be used to collect very delicate and small insects found on the back of trees?
A. Sweep net
B. Pooter
C. Pit fall trap
D. Quadrat

14. Which cell changes shape to carry out its normal function?
A. Muscle cell
B. Neurone
C. Root hair cell
D. Xylem vessel

15. The function of the diaphragm on a microscope is to
A. magnify the specimen
B. regulate the amount of light
C. reflect light into the stage
D. focus the specimen clearly.

16. Which one of the following is the role of efferent vessel of the nephron?
A. Drains the glomerulus
B. Supplies the glomerulus
C. Filters the blood
D. Purifies the blood.

17. Which one of the following factors reduces interspecific competition in a community?
A. Large number of species
B. High intraspecific competition
C. Resource partitioning
D. Similar predator – prey strategies among the species.

18. Excessive use of pesticides in the long run affects mostly?
A. Carnivores
B. Parasites
C. Producers
D. Herbivores

19. Which part of the eye contains blood vessels that supply oxygen and nutrients and removes metabolic waste from the eye?
A. Retina
B. Choroid
C. Ciliary body
D. Cornea.

20. An organism has 26 chromosomes in its brain cells. The number of chromosomes in its gamete will be
A. 26
B. 52
C. 23
D. 13

21. In which of the following organisms would gaseous exchange by simple diffusion be highly effective?
A. $\frac{Surface\ area}{Volume} = \frac{20}{5}$
B. $\frac{Surface\ area}{Volume} = \frac{10}{2}$
C. $\frac{Surface\ area}{Volume} = \frac{10}{8}$
D. $\frac{Surface\ area}{Volume} = \frac{50}{8}$

22. During the Biuret's test, $2cm^3$ of dilute sodium hydroxide NaOH was added to $2cm^3$ of solution followed by 3 drops of copper (II) sulphate solution, a purple ring formed at the surface of a solution and the rest of solution remained blue. This was caused by the error of
A. adding too little of the reagents which made the reaction incomplete.
B. adding too much of the reagent which made the reaction incomplete.
C. not shaking the mixture.
D. heating the mixture.

23. Which of the following stores carbon dioxide for a long time in the carbon cycle?
A. Living plants
B. Dead plants
C. Fossils
D. Living animals.

24. Mammals have a higher capacity to learn than other animals due to having
A. medulla oblongata
B. specialized cerebellum
C. hypothalamus
D. enlarged cerebrum.

25. Production of smooth and light pollen grain is an adaption for
A. cross pollination
B. insect pollination
C. wind pollination
D. self-pollination.

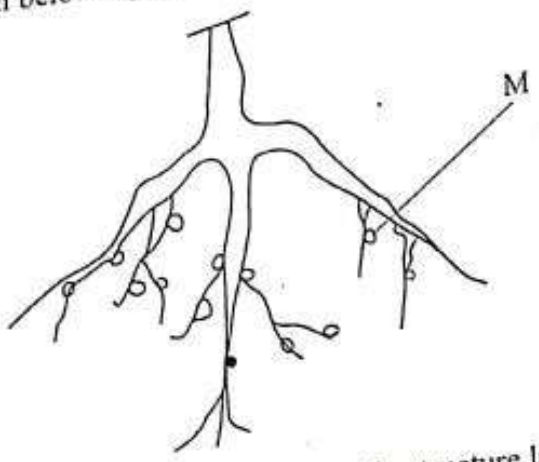
26. Which one of the following mineral deficiency in plants may lead to poor root growth?
A. Iron
B. Copper
C. Calcium
D. Phosphorus

27. In the duodenum, the products ready for absorption are those of the digestion of
A. Starch and Lipids
B. Starch only
C. Proteins and lipids
D. Lipids only.

28. The existence of ring worms on human skin is an example of
A. parasitism
B. mutualism
C. commensalism
D. symbiosis

29. Which one of the following is not a nervous problem?
A. tetanus
B. meningitis
C. polio
D. elephantiasis

30. The diagram below represents the root of a dicotyledonous plant.



The importance of the organism found in structure labelled M is to
A. convert free nitrogen in air to nitrate which is absorbed by plants.
B. store absorbed water for the plant.
C. store manufactured food for the plant.
D. carry out gaseous exchange for the plant.

SECTION B (40 MARKS)

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

Answers should be written in the spaces provided.

1. Figures (i) (ii) and (iii) show variation of rate of transpiration in different environmental conditions.

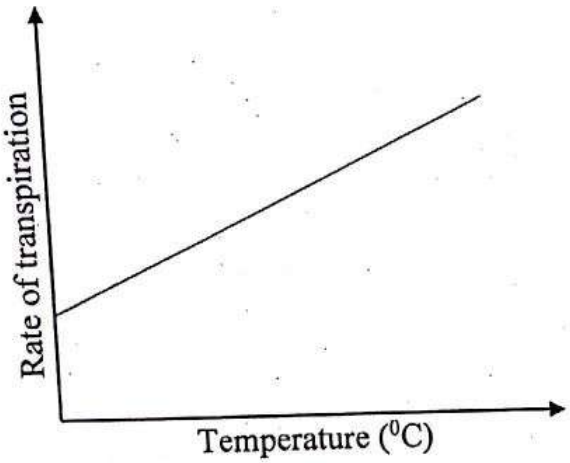


fig. (i)

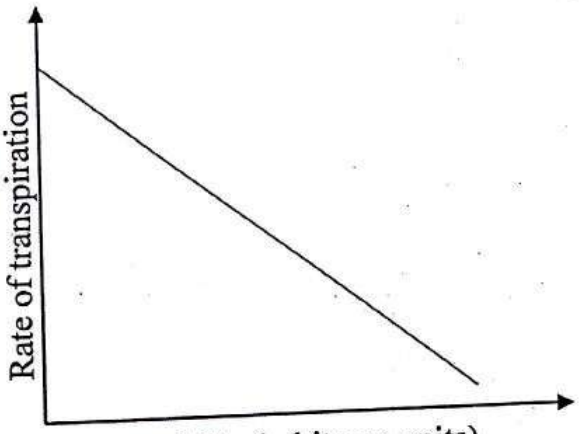


fig. (ii)

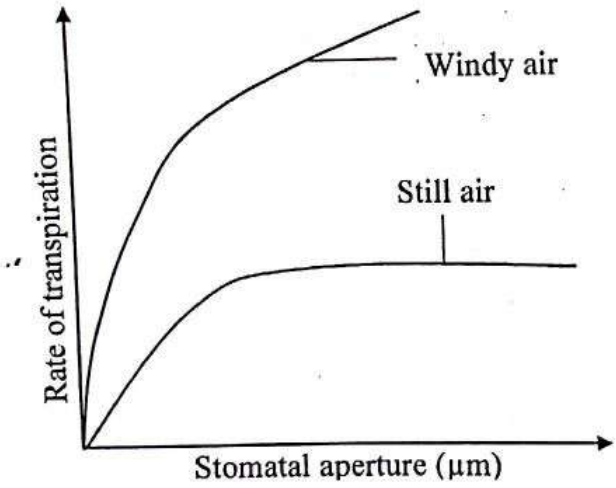


fig. (iii)

(a) What **four** conclusions can you draw from the graphs in figures (i), (ii) and (iii) above. (04 marks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Explain the conclusions you have drawn for;
Graph in figure (i) (05 marks)

.....

.....

.....

.....

Graph in figure (ii) (5 marks)

.....

.....

(c) Describe the curves in figure (iii) for
Windy air (01 marks)

.....

.....

.....

.....

Still air (02 marks)

.....

.....

.....

(d) State the **three** environmental conditions affecting rate of transpiration in the above figures. (03 marks)

.....

.....

.....

Study the diagram in figure iv below and answer the questions that follow. (02 marks)

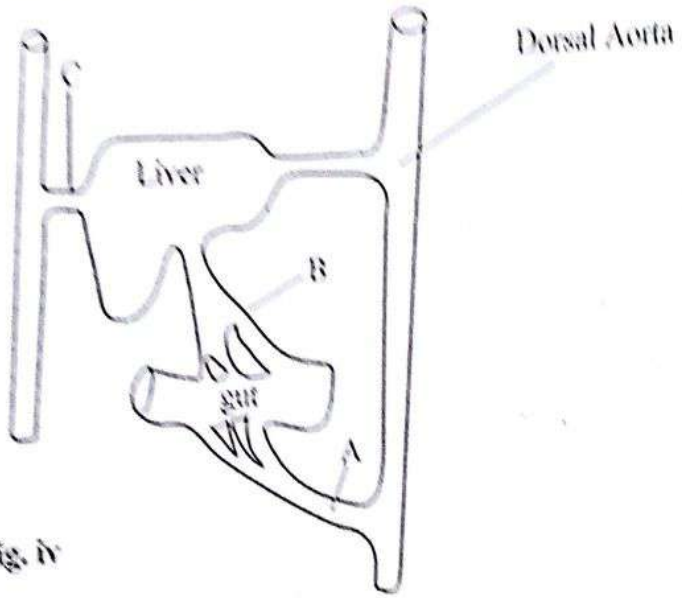


fig. iv

(a) Name the blood vessels A, B and C

Blood vessel A ..... (1 mark)

B ..... (1 mark)

C ..... (1 mark)

(b) Compare the compositions of blood in blood vessels B and C. (03 marks)

Vessel B	Vessel C
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

(c) During fasting, the level of blood glucose in vessel C may be higher than the level in vessel B. Explain. (04 marks)

.....

.....

.....

.....

33. The figure v below is a diagram of a joint of a vertebrate.

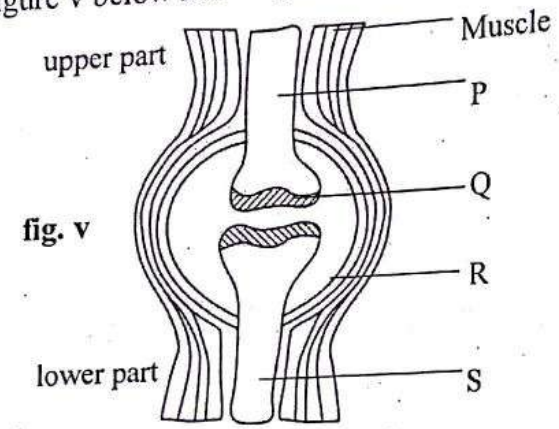


fig. v

(a) Name:

(i) Parts marked P – S

Parts: P ..... (½ mark)

Q ..... (½ mark)

R ..... (½ mark)

S ..... (½ mark)

(ii) Joint shown in the figure above. (1 mark)

.....

(b) Describe how movement is brought about at the joint. (05 marks)

.....

.....

.....

.....

.....

.....

(c) State the function of each of the parts marked Q and R. (02 marks)

Function of Q.

.....

.....

Function of R.

.....

.....

SECTION C (30 MARKS)

Answer any **two** *questions in this section. Answers are to be written in the answer booklets provided.*

34. (a) What is meant by the term Haemophilia? (02 marks)

(b) Haemophilia is a condition caused by a gene found on the X-chromosome.

A haemophilic man was crossed with a heterozygote woman.

(i) Using suitable symbols, carry out a cross to produce F_1 offsprings. (09 marks)

(ii) Give the Genotypic and the phenotypic ratios of the F_1 generation. (02marks)

(c) Suggest ways to prevent the spread of such undesirable characteristics in human population. (02 marks)

35. With examples, describe the modifications of plant leaves to perform different functions. (15 marks)

36. (a) Describe the mechanisms which promote cross-breeding in flowering plants. (12 marks)

(b) Explain how sexual reproduction may cause variation. (03 marks)

37. (a) Define the term pollution? (02 marks)

(b) Explain how various human activities have caused pollution of air. (07 marks)

(c) Explain the effects of air pollution on living organisms. (05 marks)

END

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

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

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2017
$2\frac{1}{2}$hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2hours 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.**
- *Answers to section* **A** *should be written in the boxes provided.*
- *Answers to section* **B** *should be written in the spaces provided.*
- *Answers to section* **C** *should be written on 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			

SECTION A (30 MARKS)

Answer all questions in this section.

Write the letter corresponding to the most correct answer to each question in the box provided on the right.

1. The following statements about a worker bee are all correct **except**. They
   A. have well developed wings.
   B. have pollen baskets on their hind legs.
   C. are infertile females.
   D. are fewer compared to queen bees and drones.

2. Which one of the following describes a group of many different species of organisms living together in a particular environment.
   A. Population.
   B. Community.
   C. Colony.
   D. Habitat.

3. Which one of the following is the exact effect of antidiuretic hormone (ADH) on the kidney nephrone?
   A. Pumps water across the wall of the nephrone rapidly.
   B. Creates a high water gradient between cells of the nephrone and blood capillaries.
   C. Make cells of the nephrone more permeable to water.
   D. Make cells of the nephrone more permeable to salt ions.

4. What are the chances of an offspring being sickler from a carrier father of sickle – cell anaemia with a mother who is a sickler?
   A. 100%
   B. 50%
   C. 25%
   D. 0%

5. Which one of the following characteristics of parasites would increase their chances of survival?
   A. Causing severe harm to the host.
   B. Using more than one type of host.
   C. Being highly specific.
   D. Having a membraneous cuticle.

6. What is the best reason why a mammal of 62Kg feeds on more food than a reptile of exactly the same weight.
   A. Passes out a lot of food as faeces.
   B. Stays longer on earth.
   C. Have got a higher appetite.
   D. Maintains its body temperature constant.

7. A layer in a leaf was identified with cells which are irregular in shape, having few chloroplasts, and loosely packed. The layer is most likely to be.
   A. Palisade
   B. Spongy
   C. Epidermal
   D. Cuticle

8. The following are events that occur during germination of a bean seed.
(i) Development of lateral roots.
(ii) Growth of radicle out of the testa.
(iii) Hypocotyl pull the cotyledons out of soil.
(iv) Growth of root hairs.
Which is the correct sequence of events that take place?
A. (i) (ii) (iii) and (iv)
B. (ii) (iii) (iv) and (i)
C. (ii) (iv) (i) and (iii)
D. (ii) (i) (iii) and (iv)

9. Which one of the following word equations summarizes the process of fermentation?
A. Glucose → Ethanol + Carbon dioxide + water.
B. Glucose → Lactic acid + Energy+ water.
C. Glucose → Ethanol + Carbon dioxide + Energy.
D. Glucose → Lactic acid + water + Carbon dioxide.

10. Which of the following are affected when the cerebrum is damaged?
A. Breathing and heartbeat.
B. Memory and voluntary actions.
C. Body balance and osmoregulation.
D. Osmoregulation and temperature control.

11. Which one of the following statement is **NOT** true about meiosis? It
A. results in productions of four daughter cells.
B. occurs in gonads
C. causes variations among offsprings.
D. maintains the chromosome number constant.

12. Herbaceous perennials store food reserves in storage organs.
What is the advantage of this storage?
A. Animals are attracted by the food hence effect dispersal of the plant.
B. This is the only method the plant can use up the food reserves produced by photosynthesis.
C. A supply of food is available for rapid growth of offsprings.
D. Food is kept under ground to protect it from herbivores.

13. If energy was cut off from an ecosystem containing the following organisms
1. Carnivores
2. Saprophytes
3. Herbivores
4. Grass
In which order would the organisms die out?
A. 4, 3, 2, 1
B. 4, 3, 1, 2
C. 2, 4, 3, 1
D. 4, 2, 3, 1

14. A mother fed her young child for 3 years on the following food; meat, posho, butter and irish only. From which of the following is the child likely to suffer?
A. Kwashiorkor
B. Marasmus
C. Scurvy
D. Ricket

15. A patient has a high temperature due to bacterial infection in the lungs. Which one of the following would his blood show when examined under a microscope?
A. Malarial parasites in the red blood cells.
B. Increased number of white blood cells.
C. Increased number of red blood cells.
D. Decreased number of white blood cells.

16. Which one of the following is the lowest common taxonomic group for both housefly and the tick?
A. Kingdom Animalia
B. Phylum Arthropoda
C. Phylum Chordata
D. Class Insecta

17. Which one of the following is an adaptation of fruits for self dispersal?
A. Possession of parachute.
B. Possession of stony / woody endocarp.
C. Possession of sutures.
D. Possession of sticky hairs.

18. Which one of the following is the mode of sexual reproduction in mucor/moulds?
A. Sporulation.
B. Budding.
C. Conjugation.
C. Fragmentation.

19. Which one of the following is the role of numerous mitochondria in sperm cells.
A. Increase weight of cells.
B. For nourishment of cells.
C. Control of cells activities.
D. Generates energy for propulsion.

20. The importance of Chiasmata formed during prophase I of meiosis is to
A. hold chromatids in position.
B. create cross – links between.
C. allow crossover of genes.
D. prevent crossover of genes.

21. In the mammalian eyes, which of the following parts are responsible for reception of light?
A. Cones only.
B. Rods only.
C. Cones and Choroid.
D. Cones and Rods.

22. Which one of the following respiratory substrates would be used by the body under rare conditions?
A. Proteins.
B. Glucose.
C. Fats.
D. Lipids.

23. Which one of the following occurs during raising of wings in birds?
A. Pectoralis minor contracts.
B. Both pectoral muscles relax.
C. Both pectoral muscles contract.
D. Pectoralis minor relaxes.

24. The graph in figure 1 below shows how the rate of photosynthesis varies with sunlight intensity.

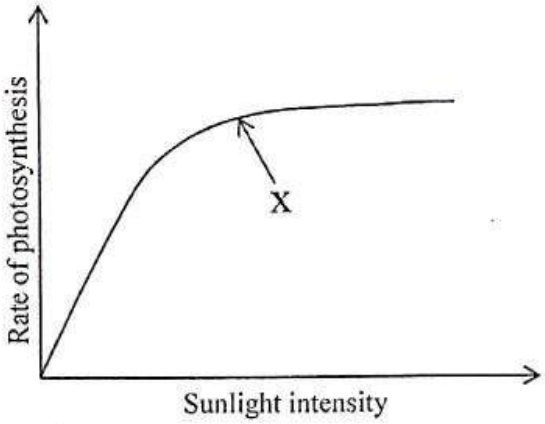


Fig. 1

Point marked X refers to the
A. carrying capacity point.
B. compensation point.
C. light saturation point.
D. deceleration point.

25. Which one of the following organisms is NOT a protist?
A. Bacteria.
B. Amoeba.
C. Paramecium.
D. Euglena.

26. Which one of the following pairs of blood constituents play a role in clotting?
A. Platelets and Vitamin D.
B. Hormones and Plasma.
C. Plasma and Vitamic C.
D. Platelets and Vitamin K.

27. The following is a dichotomous key of fruits

1 (a) It is dry..... W
(b) It is juicy..... go to 2

2 (a) Has a single seed..... X
(b) Has many seeds..... go to 3

3 (a) Has oil glands in mesocarp..... Y
(b) Has no oil glands in mesocarp..... Z

Which one of the fruits is a tomato?
A. W
B. X
C. Y
D. Z

Turn Over

28. The ability of the heart to contract without fatigue is due to
A. Sino ventricular node.
B. Cardiac muscle.
C. Bicuspid valves.
D. Tricuspid valves.

29. Which one of the following secretions is important in digestion of maltose?
A. Gastric juice.
B. Succus enterricus.
C. Pancreatic juice.
D. Saliva.

30. Which one of the following is the best method for measuring growth rate of maize seedling from 3 to 6 weeks?
A. Height.
B. Fresh weight.
C. Dry weight.
D. The number of leaves.

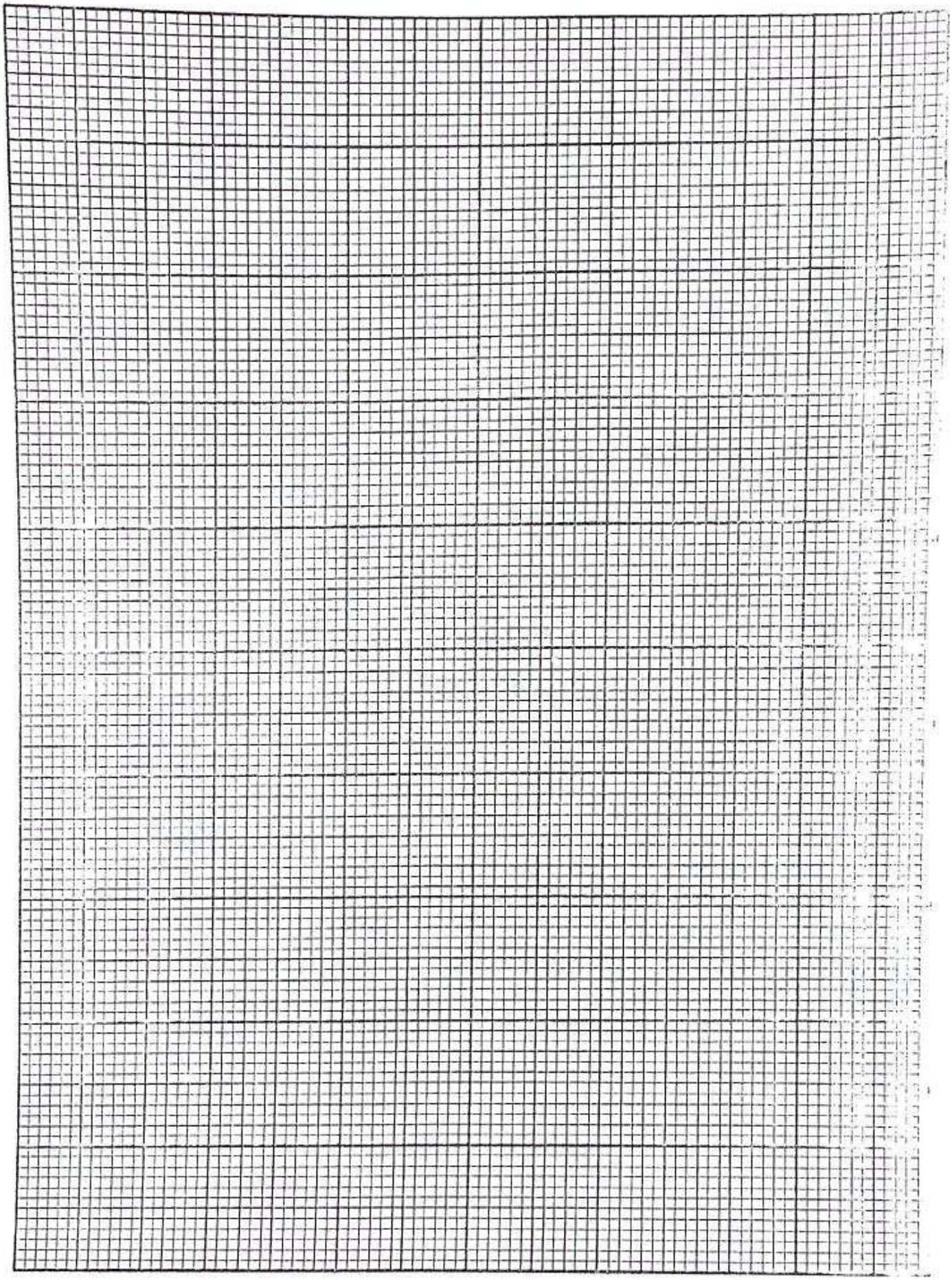
SECTION B (40 MARKS)

Answer all questions in this section, writing your answers in the spaces provided.

31. The table below shows the results of an experiment on soil.
Two glass tubes of equal diameter were filled with equal volumes of dry soil samples A and B, and one end of each tube was placed in water. The experiment was observed at intervals over a period of eight hours.

Time in hours	Height reached by water in cm	
	Soil sample A	Soil sample B
0	0	0
0.5	15	5
1.0	25	15
2.0	28	32
4.0	30	41
6.0	30	46
8.0	30	48

(a) Plot a graph of height reached by water in the two soil samples against time on same axes. (07 marks)



Turn Over

(01 marks)

(b) What was the aim of the experiment?

.....

.....

.....

.....

(c) From the graph explain the difference in height reached by water in the two soil samples between;

(04 marks)

(i) 0 and 2 hours

.....

.....

.....

.....

.....

.....

.....

.....

(04 marks)

(ii) 2 and 8 hours

.....

.....

.....

.....

.....

.....

.....

(d) State with a reason, which soil has more plant nutrients? (02 marks)

.....

.....

.....

(e) Explain how the physical properties of soil sample B can be improved.

(02 marks)

.....

.....

.....

.....

(f) Name **two** other physical properties of soil sample B. (02 marks)

.....

.....

32. The figure below is a schematic diagram of the digestive system in mammals.

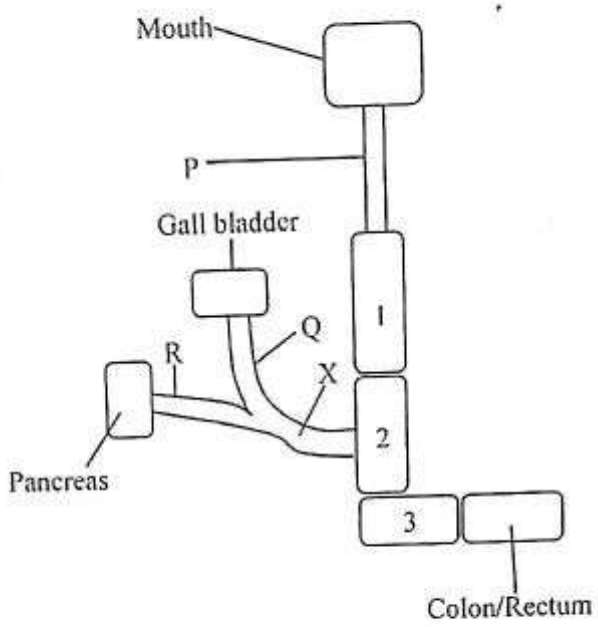


Fig. 2

Chamber where digestion of food occurs.

(a) Name the chambers marked 1, 2, 3 and structures marked P, Q, R. (03 marks)

(i) Chambers 1, 2 ,3.

1:.....

2:.....

3:.....

(ii) Structures P, Q, R

P:.....

Q:.....

R:.....

(b) State the functions of the gall bladder and pancreas. (02 marks)

(i) Gall bladder

.....

.....

(ii) Pancreas

.....

.....

.....

(c) Explain the effect of blockage of part X on digestion of food in chamber marked 2. (04 marks)

.....

.....

.....

.....

.....

(d) State one adaptation of chamber marked 3 for digestion of food. (01 marks)

.....

.....

33. Three potted plants A, B and C with the same surface area of leaves and a mass of 300g were measured on a weighing scale. A polythene bag was then wrapped around the pot of soil.

The plants were placed in different environmental conditions for 12 hours and their masses were measured again. The results are shown in the table below.

Plant	Environmental condition	Mass in grams after 12 hours
A	Warm air in light	294.4
B	Cold air in darkness	299.8
C	Windy air in light	286.3

(a) (i) Name the process responsible for causing the change in mass of the plants after 12 hours. (½ mark)

.....

(ii) Suggest a reason why plants of the same surface area of leaves were used. (01 marks)

.....

(b) Explain why a polyethene bag was put around the pot of soil before the experiment. (01 marks)

.....

.....

(c) Explain the change in mass of each potted plant after 12 hours. (06 marks)

(i) Plant A;

.....

.....

.....

.....

(ii) Plant B;

.....

.....

.....

.....

(iii) Plant C;

.....

.....

.....

.....

(d) The experiment was repeated with potted plant C having its leaves smeared with vaseline. Suggest with reason whether its mass will increase or decrease after the 12 hours period. (01½ mark)

.....

.....

.....

SECTION C (30 MARKS)

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

Any additional question(s) answered will not be marked.

34. (a) Describe gaseous exchange at the alveolus of mammalian lungs. (07 marks)

(b) Explain the difference in composition of inspired and expired air in humans. (08 marks)

35. (a) Explain the effect of air pollutants on living organisms. (10 marks)

(b) Suggest control measures against air pollution. (05 marks)

36. (a) What is meant by the term homeostasis. (02 marks)

Turn Over

(b) Explain the role of the following organs in temperature regulations.

(i) Liver (04 marks)

(ii) Skin (07 marks)

(c) Name any other **two** organs in the human body involved in homeostasis. (02 marks)

37. (a) Distinguish between geotropism and phototropism. (02 marks)

(b) Describe an experiment to show geotropism in a been seedling. (10 marks)

(c) State **three** importances of tropisms to plants. (03 marks)

END

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

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

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2018
2½hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(THEORY)

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

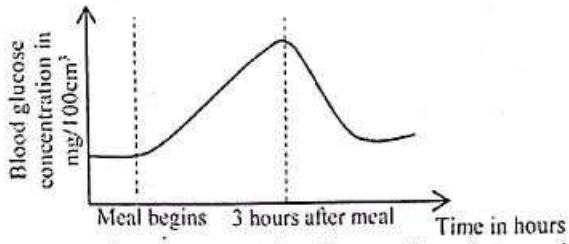
- *This paper consists of three sections;* **A, B** *and* **C.**
- *Answer* **all** *questions in sections* **A** *and* **B,** *and any* **two** *questions from section* **C.**
- *Any additional questions answered will not be marked.*
- *Answers to section* **A** *should be written in the boxes provided,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

SECTION A (30 MARKS)

Answer all questions in this section.

1. The following graph shows the blood glucose concentration in a healthy person before, during and after a meal..



What hormone causes the decrease in glucose level three hours after the meal?

A. Antidiuretic hormone.
B. Glucagon.
C. Insulin.
D. Oestrogen.

2. Which one of the following terms describes the change from plant proteins to ammonium compounds.

A. Nitrification.
B. Putrification.
C. Fermentation.
D. Denitrification.

3. In cell division chromosomes align along the equatorial region during

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

4. The success of a mosquito in spreading pathogens may be attributed to presence of ;

A. wings and claws.
B. legs and wings.
C. proboscis and wings.
D. proboscis and claws.

5. Essential Amino acids are referred to as essential because they

A. are the only one the body requires.
B. are of high biological value and the body can make them.
C. can only be provided from an artificial source.
D. are of high biological value and the body cannot make.

6. Which sequence describes the flow of energy in an ecosystem?

A. Carnivore → herbivore → plant → sun
B. Plant → herbivore → carnivore → sun
C. Sun → carnivore → herbivore → plant
D. Sun → plant → herbivore → carnivore

7. A field produces a poor crop yield of maize after being used for the same crop for several years. Beans were grown and the following year maize was grown again successfully. Which of the following is the probable explanation of the effects of beans on the soil? The…

A. texture of soil was improved.
B. amount of humus in the soil was increased.

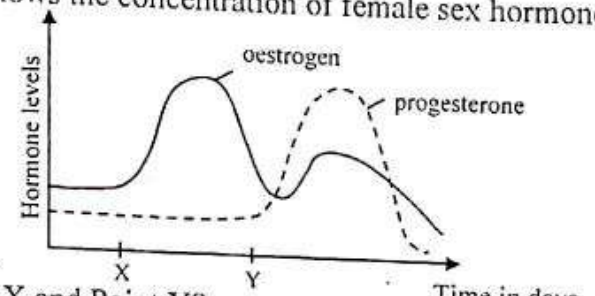
C. nitrogen content was increased.
D. acidity of the soil was reduced.

8. Which part of the brain controls reflex activities of the body?
A. cerebrum.
B. cerebellum.
C. medulla oblongata.
D. hypothalamus.

9. In which of the following parts of the maize grain are most carbohydrates stored?
A. Cotyledon.
B. Radicle.
C. Endosperm.
D. Plumule.

10. Which one of these cell organelle would be most active at sites where substances move against diffusion gradient?
A. Nucleus.
B. Mitochondria.
C. Chloroplasts.
D. Ribosomes.

11. The following graph shows the concentration of female sex hormones in the blood over time.



What happens at point X and Point Y?

	X	Y
A.	Menstruation	Ovulation
B.	Menstruation	Repair of uterus wall lining
C.	Repair of uterus wall lining	Menstruation
D.	Repair of uterus wall lining	Ovulation

12. The first step in the test for starch in a leaf, is to place the leaf in boiling water for about one minute. What is the purpose of this step? To…
A. denature all enzymes in the leaf.
B. make the leaf softer so that it is easier to test for starch.
C. remove air in the leaf.
D. remove chlorophyll from the leaf.

13. Low land atheletes report for a sports competition organized on high lands three months before the competition? This would be in order for them to acquire.
A. higher fat deposits under their skin.
B. larger muscles.
C. higher erythrocyte numbers.
D. higher leucocyte numbers.

14. A scout standing for long in a parade may faint and fall down. Which of the following is the best explanation?
A. There is less oxygen supply to brain.
B. The leg muscles became paralysed.

C. He could have drunk a lot of alcohol before.
D. There was accumulation of lactic acid in the muscles.

15. Which conditions would cause a plant to wilt most rapidly?
A. High humidity, high temperature, high wind speed.
B. High humidity, low temperature, high wind speed.
C. Low humidity, high temperature. high wind speed.
D. Low humidity, low temperature. high wind speed.

16. Suppose one's pancreas gets damaged. what would happen to that person? He would develop;
A. Kwashiorkor.
B. Diabetes insipidus
C. Diabetes mellitus.
D. Malaria.

17. A pastoralist will always retain within his herd a bull whose characteristics are desirable. This is an example of
A. crossing over.
B. artificial insemination.
C. cross breeding.
D. artificial selection.

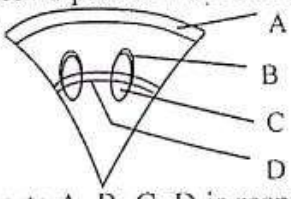
18. Which of the following forms of fusion will result into formation of the primary endosperm in seed?
A. The tube nucleus with egg cell.
B. Generative nucleus with egg cell.
C. one male nucleus with egg cell.
D. Second male nucleus with polar nuclei.

19. Which of the following changes when one walks out of a brightly lit place to a poorly lit place? The…
A. pupils become larger.
B. lens becomes longer.
C. pupils become narrower.
D. lens becomes thicker.

20. Which of the following eye defects is corrected by using cylindrical lenses
A. Hypermatropia.
B. Glaucoma.
C. Myopia.
D. Astigmatism.

21. Accumulation of Lactic acid in muscles of an athlete during exercise is due to
A. Persperation.
B. Anaerobic respiration.
C. Panting.
D. Aerobic respiration.

22. The diagram below shows part of a section through a stem



Which one of these parts A, B, C, D is responsible for secondary growth?

The following events occur during the upstroke of flapping flight in birds except
A. pectoralis minor muscles contract.
B. pectoralis major muscles relax.
C. pectoralis minor muscles relax.
D. wings are pulled up wards.

4. Very small mammals need to feed almost continuously because of their
A. high surface area: volume ratio hence consequent rapid heat loss.
B. low surface area: volume ratio hence consequent rapid heat loss.
C. high surface area: volume ratio hence consequent low heat loss.
D. low surface area: volume ratio hence consequent low heat loss.

25. Which of the following characteristics are true for all insects?
P undergo incomplete metamorphosis.
R bear jointed limbs.
S bear tree pairs of limbs.
Q possess wings.
T bodies are divided into three main parts.

A. P and S.
B. T and Q.
C. T and S.
D. R and P.

26. Which one of the following cells are for food storage in plant?
A. Collenchyma cells.
B. Guard cells.
C. Parenchyma cells.
D. Sieve tube cells.

27. Which of the following bones are connected to form a pivot joint?
A. Atlas and Axis.
B. Femur and tibia.
C. carpels and wrist.
D. Humerus and scapula.

28. The best method to determine the population of Oxalis species plant is?
A. quadrat method.
B. capture mark, recapture method.
C. line transect.
D. direct counting.

29. After a volcanic eruption has covered an area with lava, which of the following is the most likely order of succession of the area?
A. Lichens → grasses → shrubs → trees
B. Mosses → grasses → lichens → trees
C. Grasses → trees → Mosses → lichens
D. Shrubs → grasses → trees → lichens

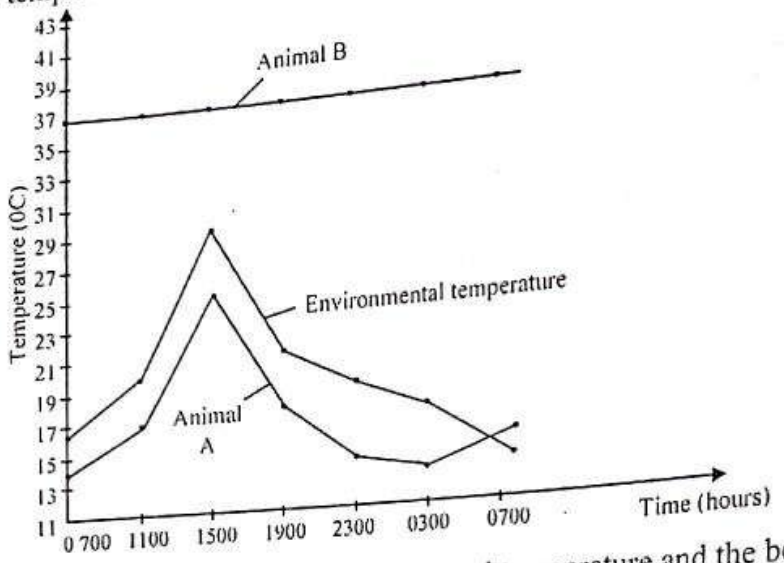
30. Which one of the following parts of the middle ear is linked to the inner ear?
A. Auditory nerve.
B. Eardrum.
C. Cochlea.
D. Oval window.

Turn Over

SECTION B (40 MARKS)

Answer all questions in this section, writing your answers in the spaces provided.

31. The figure below shows graphs of body temperature of animals A and B plus the environmental temperature plotted against time of the day.



a) What is the relationship between environmental temperature and the body temperature of animal?

i) A _____ (1 mark)

_____

ii) B _____ (1 mark)

_____

b) Explain the relationship between environmental temperature and the body temperature of animal.

i) A _____ (1 mark)

_____

ii) B _____ (1 mark)

_____

c) From the graphs predict and explain how active the animals A and B would be at night time. (5 marks)

_____

_____

_____

_____

_____

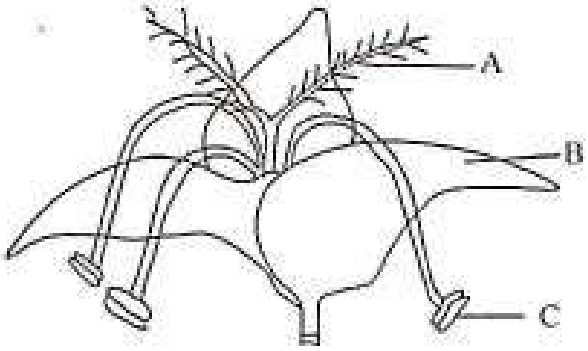
_____

d) What advantage does this give one animal over the other in respect of being active? (5 marks)

_____

e) How are mammals in cold areas adapted to temperature control? (6 marks)

32. Study the diagram below of flower of a plant and answer the questions that follow.



a) Name the parts labelled A, B and C. (1 ½ marks)

A.

B.

C.

b) Suggest the agent of pollination for the flower. (½ mark)

c) State the adaptations of the flower for the agent of pollination mentioned in (b) above. (4 marks)

d) State the conditions that promote cross pollination in flowers. (4 marks)

33. a) Name a vitamin, an enzyme and a mineral element that are involved in the blood clotting process. (3 marks)

Vitamin _____

Enzyme(s) _____

Mineral element _____

b) Give reasons why knowledge about human blood groups is important during transfusion. (3 marks)

_____

_____

_____

_____

c) State **two** ways by which white blood cells fight micro-organisms. (2 marks)

_____

_____

d) Name the diseases of blood described by the following symptoms. (2 marks)

i) In ability of the blood to clot.

_____

ii) Crescent-shaped red blood cells with abnormal hemoglobin.

_____

SECTION C (30 MARKS)

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

34. a) What is soil conservation? (2 marks)

b) State **four** ways through which soil fertility can be conserved. (4 marks)

c) Explain why some fish die when large amounts of fertilizers are eroded into the lake. (3 marks)

d) Besides fertilizers, state three other water pollutants and their respective effects to aquatic life. (6 marks)

35. Describe how the following parts of the human digestive system are adapted to their functions;

i) mouth. (4 marks)

ii) stomach. (5 marks)

i) duodenum. (4 marks)

ii) colon. (2 marks)

36. a) What is sexual reproduction? (2 marks)

b) Describe the growth of the pollen tube and the process of fertilization in flowering plants. (7 marks)

c) Describe an experiment to show that oxygen is necessary for germination. (6 marks)

37. a) State the differences between short sightedness and long sightedness. (5 marks)

b) How is a human eye suited for sight. (8 marks)

c) Name **two** other eye defects. (2 marks)

END