

NAME:.....

CENTRE/ INDEX No.....

SCHOOL.....

SIGNATURE:.....

553/1
BIOLOGY
(Theory)
PAPER 1
July/August 2017
2½hours



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 membranous 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 $\rightarrow$ Ethanol + Carbon dioxide + water.
 - B. Glucose $\rightarrow$ Lactic acid + Energy + water.
 - C. Glucose $\rightarrow$ Ethanol + Carbon dioxide + Energy.
 - D. Glucose $\rightarrow$ 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

Turn Over

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.
D. 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.

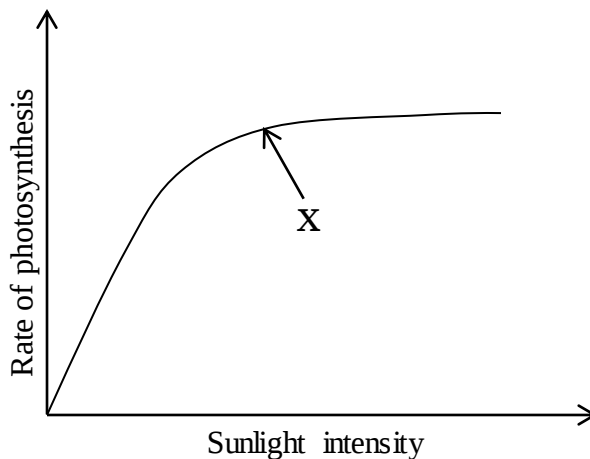


Fig. 1

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

☐

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 entericus.
 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.

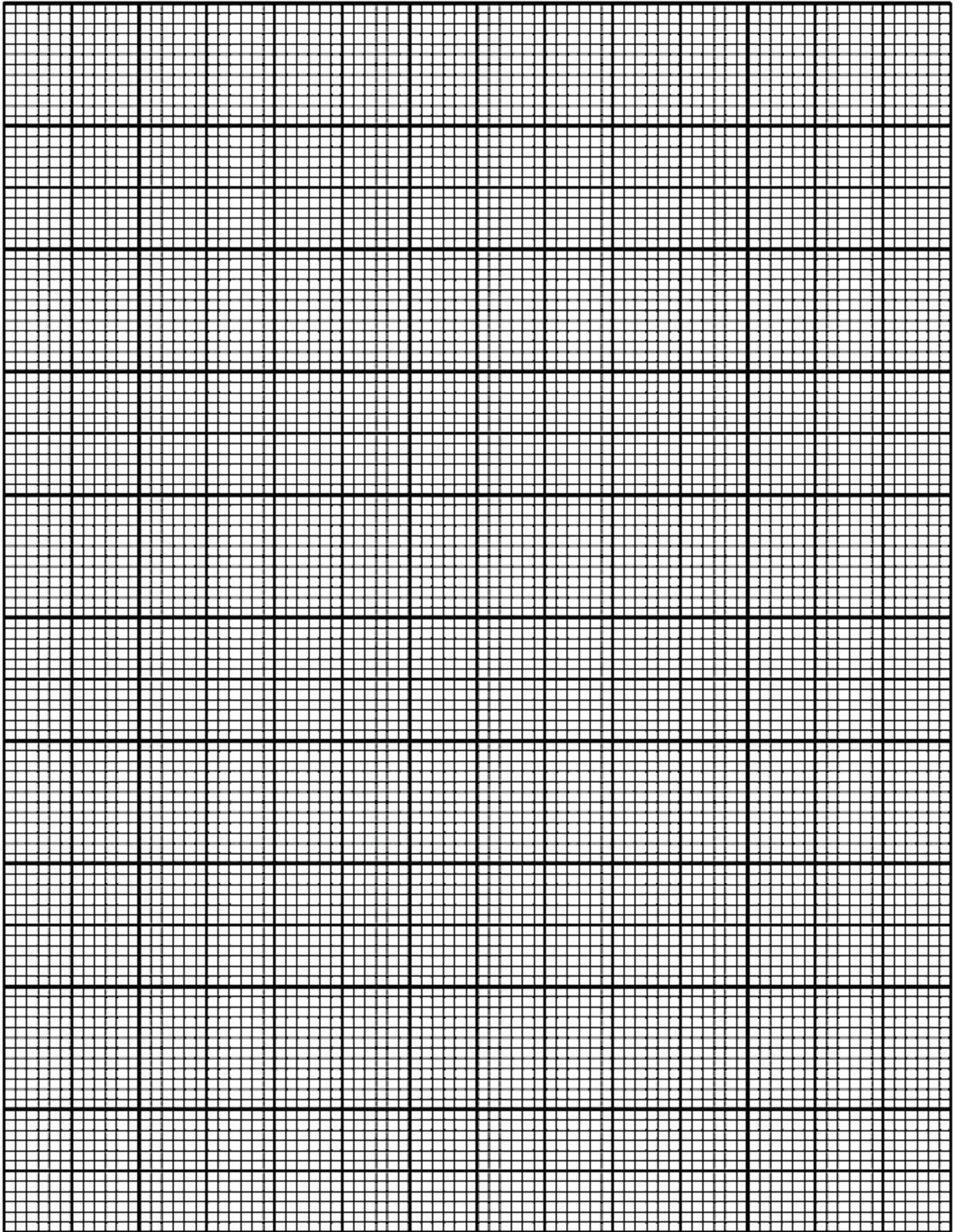
SECTION B (40 MARKS)

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

(b) What was the aim of the experiment ? (01 marks)

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

(i) 0 and 2 hours (04 marks)

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(ii) 2 and 8 hours (04 marks)

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

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(e) Explain how the physical properties of soil sample B can be improved. (02 marks)

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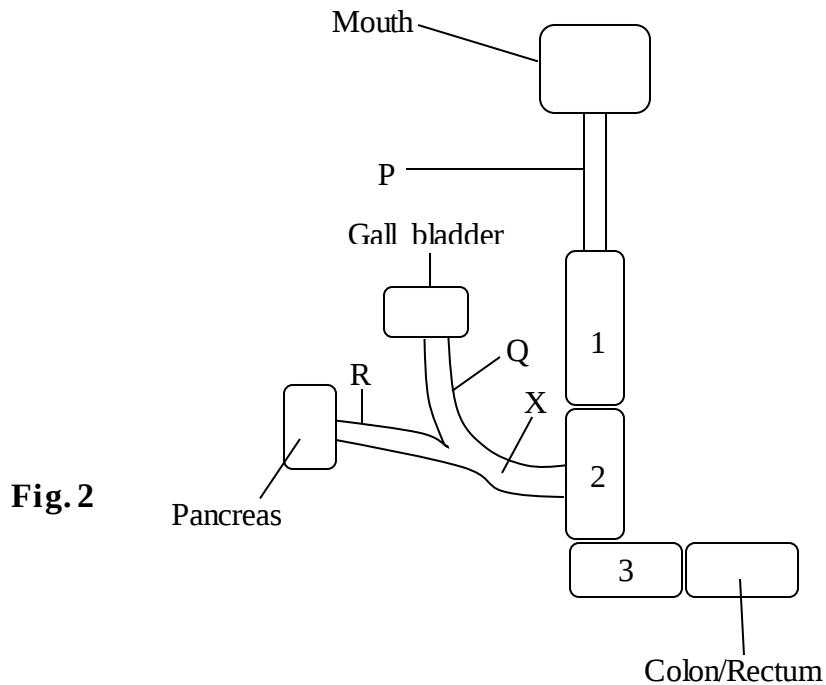
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(f) Name **two** other physical properties of soil sample B. (02 marks)

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



☐ 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

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Turn Over

(ii) Pancreas

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

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

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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)

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

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

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- (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)
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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 bean seedling. (10 marks)
- (c) State **three** importances of tropisms to plants. (03 marks)

END