

NAME:

INDEX NUMBER: SIGNATURE:

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BIOLOGY PAPER 1

(THEORY)

Jul/Aug. 2023

Uganda Certificate of Education
MOCK EXAMINATIONS
BIOLOGY PAPER ONE
(THEORY)
2 HOURS 30 MINUTES

Instructions

- † Attempt all questions in section A and B plus any TWO questions from section C.
- † Answers to section A must be filled in boxes on the right-hand side.
- † Answers to section B must be written in the spaces of the question paper provided.
- † Answers to section C must be written on separate answer sheets/booklet provided. ♦ Use lead pencil for drawings.

FOR EXAMINERS' USE ONLY			
Section		Marks	Examiner's Signature & No.
A			
B	No. 31		
	No. 32		
	No. 33		
C	No.		
	No.		
TOTAL			

SECTION A (30 MARKS)

1. Which of the following events occur during inhalation in a mammal?

- A. Diaphragm contracts, ribs raised
- B. Diaphragm relaxes, ribs lowered
- C. Internal intercostal muscles contract, pressure in chest cavity increases
- D. Internal intercostal muscles relax, pressure in chest cavity increases

2. Four stripes of fresh potato are cut and the length of each strip is measured and placed in distilled water. The others in sucrose solutions of different concentrations. After 45 minutes, the lengths of the strips are measured again. The results are as indicated in the table below.

Liquid	P	Q	R	S
Original length of strip (mm)	74	77	81	86
Final length of strip (mm)	74	84	79	87

Which of the liquids is distilled water?

- A. P
- B. Q
- C. R
- D. S

3. Which of the following explains why digestion of starch does not occur in the stomach?

- A. Absence of starch digesting enzymes
- B. Low PH for starch digesting enzymes
- C. High PH for starch digesting enzymes
- D. Short time spent by food in the stomach

4. The speed of blood flow is slowest in the

- A. Veins
- B. Venules
- C. Blood capillaries
- D. Arterioles

5. A student heated strongly a dry soil sample to a constant mass. The loss of mass in the soil is due to

- A. Loss of mineral salts
- B. Escape of air
- C. Loss of water
- D. Destruction of humus

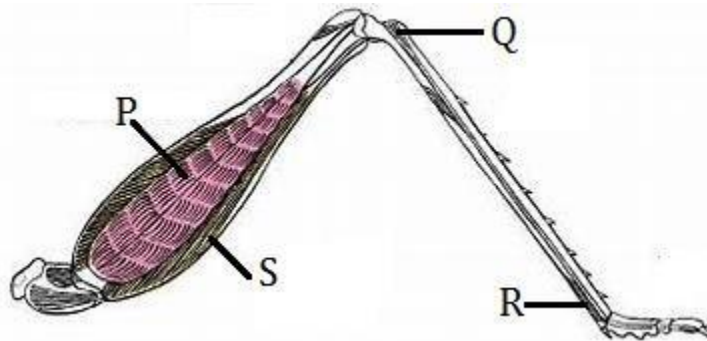
6. A rabbit is able to utilize cellulose because it
- Has symbiotic bacteria in the stomach
 - Has symbiotic bacteria in the caecum
 - Has a very long alimentary canal
 - Secretes the enzyme cellulase

☐

7. In the following structures food is stored in a stem except
- Corm
 - Bulb
 - Rhizome
 - Tuber

☐

8. The diagram below shows different muscles in the hind leg of a grass hopper



Which muscles contract when the grass hopper strains the legs?

- P
 - Q (iii) R
 - S
- (i) and (ii) only
 - (i) and (iii) only
 - (ii) and (iii) only
 - (ii) and (iv) only

☐

9. Which of the following groups of types of placentation is not for berries?
- Marginal and basal placentation
 - Free central and axile placentation
 - Central and parietal placentation
 - Parietal and free central placentation

☐

10. Below is a dichotomous key, use it to answer the question

- 1 (a) Has wings go to 2
 (b) Lacks wings go to 3

- 2 (a) Has 2 wings P
 (b) Has 4 wings Q
 3 (a) Lacks eyes R
 (b) Has eyes S

Which organism is most likely to be a soldier termite?

- A. P
 B. Q
 C. R
 D. S

☐

11. The best method of measuring the growth rate of seedling is by

- A. Taking records of dry weight
 B. Measuring the fresh weight
 C. Observing the increase in volume
 D. Observing the increase in the size of the leaves

☐

12. Leaves are distinguished from leaflets by the fact that;

- A. Leaves have leaflets
 B. Leaves have buds in their axils
 C. Leaves are bigger than leaflets
 D. Leaves grow from the main stem

☐

13. The data below shows the amount of carbon dioxide in inhaled air, rate of breathing at rest and volume of air in a breath, in humans:

Percentage of carbon dioxide inhaled air= 0.025%

Number of breaths per minute=36

Volume of one breath taken in at rest= 500cm^3

The volume of carbon dioxide inhaled per minute while at rest is

- A. 0.9cm^3
 B. 45cm^3
 C. 12.5cm^3
 D. 450cm^3

☐

14. A sample of urine from a man was boiled with Benedict's solution and the mixture turned orange in colour. Which of the following is the best deduction about the condition of this man?

- A. There was a lot of glycogen in his blood
 B. He has a deficiency of insulin in his blood
 C. His diet has a lot of sugar
 D. His kidneys were damaged

☐

15. Which comparison between a vein and lymphatic vessel is correct?

	Vein	Lymphatic vessel
A	Leucocytes are present	Leucocytes are absent
B	Valves are present	Valves are absent
C	Erythrocytes are present	Erythrocytes are absent
D	Platelets are absent	Platelets are present

16. Digestion of proteins in mammals starts in the

- A. Stomach B. Mouth C. Duodenum D. Ileum

17. Which one of the following is a taxonomic class?

- A. Annelida B. Arthropoda C. Arachnida D. Platyhelminthes

18. When testing for non-reducing sugar in a solution, hydrochloric acid is added to the solution in order to:

- A. Provide a suitable PH B. Kill any bacteria in the solution
C. Hydrolyze the non – reducing sugar D. Catalyse the reaction

19. Which one of the following is not a characteristic of monocotyledonous plants?

- A. Parallel venation
B. Fibrous roots
C. Leaf sheath
D. Cork layer

20. An individual deficient in anti-diuretic hormone is likely to produce.

- A. Vast quantities of dilute urine B. Urine containing glucose
C. Little concentrated urine D. Urine containing proteins

21. The role of the luteinising hormone is to:

- A. Cause ovulation B. Thicken the uterine wall
C. Cause development of the graafian follicle D. Maintain pregnancy.

22. Which one of the following is a correct difference between sensory and motor neurons?

MOTOR NEURONS	SENSORY NEURONS
A. Carry impulses from receptors to the central nervous system	Carry impulses from the central nervous system to effectors
B. Cell body on the side of the axon	Cell body at the end of the axon
C. Has long axon	Has short axon
D. Cell body in the central nervous system	Cell body outside the central nervous system

☐

23. When observed under a hand lens of magnifying power X15, the image of a hair in the nasal cavity appears 3mm long. What is the actual length of this hair?

- A. 0.2mm B. 0.5mm C. 5mm D. 45mm

☐

24. Which of the following characteristics of respiratory surfaces is true of humans but not of insects?

- A. Highly vascularized B. Large surface area
C. Moist lining D. Thin walled.

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25. Which of the following hormones control carbohydrate metabolism?

- A. Insulin and Glucagon B. Vasopressin and insulin
C. Insulin and oxytocin D. Prolactin and oxytocin

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26. Mucor undergoes sexual reproduction by use of:

- A. Spores B. Pollen grains C. Zygosporangia D. Zoospores

☐

27. When radial muscles of the iris contract:

- A. The pupil becomes smaller B. Suspensory ligaments become tight
C. The lens becomes thin D. The eye ball shortens

☐

28. People who travel on an open lorry on a cold misty morning are likely to experience:

- A. Vaso- constriction B. Vasodilation C. Palpitation D. Perspiration

☐

29. Albinism is caused by a double recessive gene aa. If a carrier Aa marries an albino, what percentage of their offspring will be albino?

A. 25% B. 50% C. 75% D. 100%

30. To which trophic levels do the organisms that are found in a grassland having antelopes grazing in it belong?

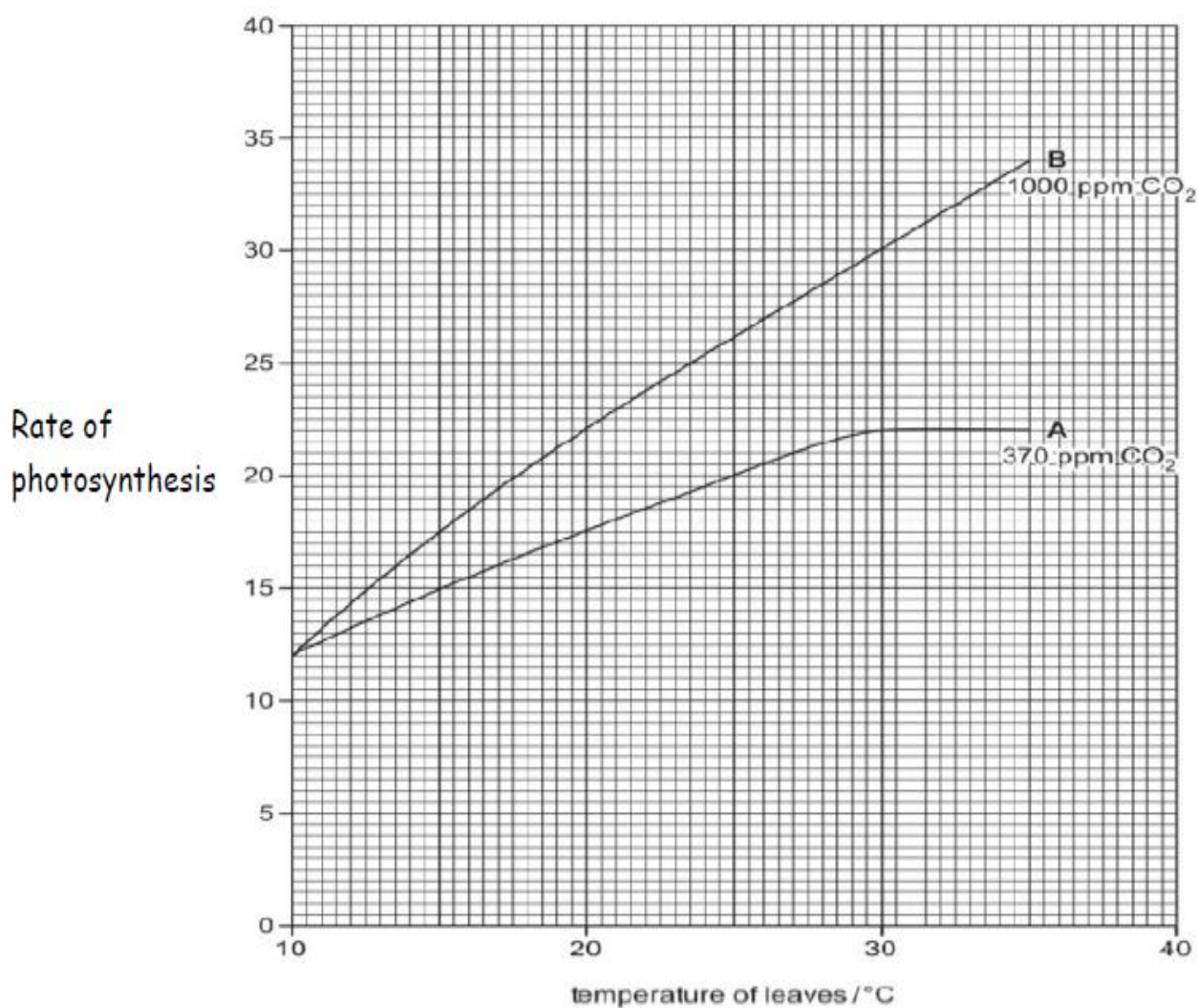
	Antelopes	Grass
A	Decomposers	Primary Consumers
B	Decomposers	Secondary consumers
C	Primary consumers	Primary producers
D	Primary producers	Primary Consumers

SECTION B: (40MARKS)

Answer all questions in this section.

Answers must be written in the spaces provided.

31. A student investigated the effect of temperature on the rate of photosynthesis of leaves of a Chinese plant, *Plantago asiatica* at two different concentrations of Carbondioxide, **A** and **B**.



- (a) Describe the effect of temperature on the rate of photosynthesis at;
(i) Carbon dioxide concentration A (01 mark)

.....
.....

(ii) Carbon dioxide concentration B

(02 marks)

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(b) State two similarities and two differences in the rates of photosynthesis at carbon dioxide concentrations A and B

(i) Similarities

(02 marks)

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(ii) Differences

(02 marks)

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(c) Explain how the temperature affected the rate of photosynthesis of the plant at Carbon dioxide concentration A

(03 marks)

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(d) Calculate the percentage increase in the rate of photosynthesis at 30°C when the Carbon dioxide concentration was increased from A to B

(02 marks)

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(e) With a reason, predict what would happen to the rate of photosynthesis if the investigation at Carbon dioxide concentration A is continued at temperatures higher than 45°C (02 marks)

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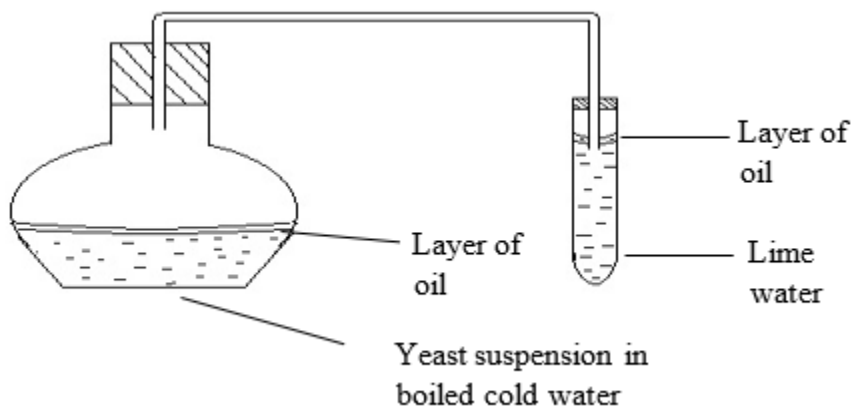
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(f) State the other two environmental factors that must have been maintained constant for the rate of photosynthesis to be effective (02 marks)

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32. Study the diagram below and answer questions that follow



(a) Suggest the title for the above experiment (01 mark)

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(b)(i) What are the observations during the experiment (01 mark)

(ii) Explain the observation(s) above

(04 marks)

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(c) Give a reason for the following in relation to the experiment

(i) Why is the suspension of yeast mixed in water that is first boiled and then Cooled?

(01 mark)

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(ii) Why is the layer of oil poured over the yeast suspension

(01 mark)

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(iii) Write a word equation to summarize the reactions taking place in tube A. (01 mark)

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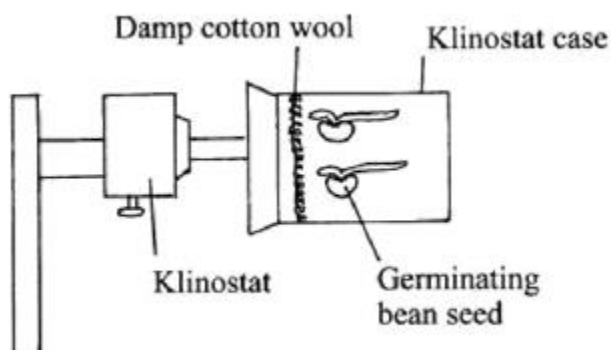
(d) State an industrial application of the type of respiration above

(01 mark)

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33. In an experiment to investigate a plant response, the set up shown in the diagram below was used.



(a) Name the type of response that was being investigated. (01 mark)

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(b) If the Klinostat was not rotating:

(i) state the observations that would be made on the seedlings after three days

(01 mark)

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(ii) explain the observations in (b) (i) above, (03 marks)

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(c) If the experiment was repeated with the Klinostat rotating:

(i) State the observation that was made on the seedlings after three days. (01 mark)

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(ii) Give reason for the observation made on the seedlings. (03 marks)

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(d) What is the importance of the response being investigated to plants? (01 mark)

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SECTION C (30MARKS)

Answer TWO questions from this section.

Answers should be written on the answer sheets provided

34. (a) Define the term “**eutrophication**” in relation to polluted waterbody (01 marks)
(b) Explain how humans have led to pollution of Lake Victoria (10 marks)
(c) How has the government of Uganda controlled the problem of pollution of Lake Victoria (04 marks)
35. (a) Distinguish between homozygous and heterozygous state in genetics (02 marks)
(b) (i) Which chromosomes are responsible for determining sex in humans? (01 marks)
(ii) Using appropriate symbols, illustrate how sex is determined in humans (04 marks)
(c) Red-green colour blindness is a defect caused by recessive gene carried on the X-Chromosome.
(i) Explain the effect of an X chromosome carrying that recessive gene above (02 marks)
(ii) A woman with normal eye sight married a colour blind. Using suitable symbols, describe what would be the probability that they would produce a boy with normal eye sight (06 marks)
36. (a) With examples, describe the modifications of plant leaves to perform different functions (10 marks)
(b) Outline the mechanisms certain flowering plants use in order to promote cross-breeding (10 marks)
37. (a) What is meant by the term “homeostasis” (01 mark)
(b) Explain the roles of the liver and kidney in homeostasis in man (10 marks)
(c) State the differences between the mechanisms of temperature regulation in man during cold conditions and hot conditions (04 marks)

END