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553/1

BIOLOGY

PAPER 1

June/July 2017

2½ hours

MWALIMU EXAMINATIONS BUREAU

UCE PRE-MOCK RESOURCE EXAMINATIONS 2017

BIOLOGY

PAPER 1

2HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES

- ✓ Attempt **all** questions in section A and B.
- ✓ Attempt **only** two (2) questions in section C.
- ✓ Answers to section A and B should be written in the spaces provides and answers to section C in the answer booklets provided.
- ✓ All work must be precise and neat.
- ✓ Indicate numbers attempted in section C.

FOR EXAMINER'S USE ONLY

SECTION	MARKS	INITIALS
A		
B 31		
32		
33		
C No:		
No:		
TOTAL		

SECTION A (30 MARKS)

1. Which of the following is the correct hierarchy of classification of organisms?
 - A. Species, phylum, class, order, family, genus.
 - B. Species, genus, family, order, class, phylum.
 - C. Species, family, genus, class, order, phylum.
 - D. Species, class, genus, order, family, phylum.

2. Plants which have male and female flowers on separate trees are referred to as.....
 - A. dioecious plants.
 - B. monoecious plants.
 - C. pistillates.
 - D. staminate.

3. Which of the following pairs of cells does not have nucleus when mature?
 - A. Erythrocytes and Leucocytes.
 - B. Erythrocytes and Sieve tubes.
 - C. Leucocytes and Companion cells.
 - D. Sieve tubes and Leucocytes.

4. The best way of finding out the number of rats in an abandoned farmland is by....
 - A. direct counting.
 - B. quadrat method.
 - C. line transect.
 - D. capture – mark – recapture.

5. Which one of the following is a long term adaptation of a mammal to living in low environment temperature?
 - A. Increased metabolic rate.
 - B. Raising the hair of the skin.
 - C. Deposition of fat under the skin.
 - D. Reduction of blood flow to the skin.

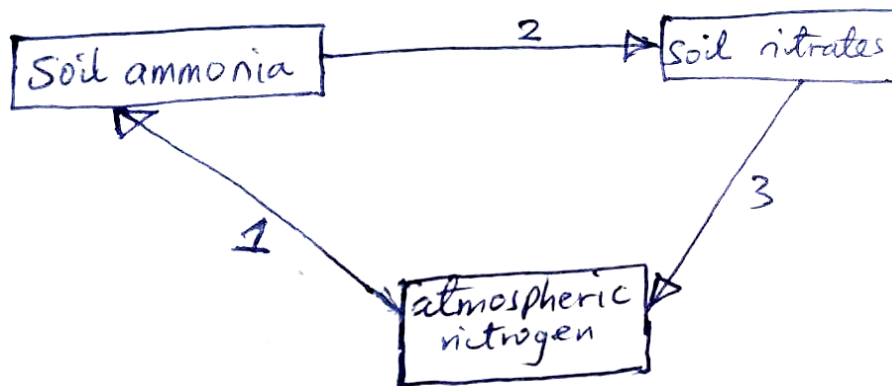
6. A student observed and recorded the following characteristics on a vertebra.
 - (i) Long neural spine.
 - (ii) Wide neural canal.
 - (iii) Short transverse processes.The vertebra was.....
 - A. cervical.
 - B. atlas.
 - C. thoracic.
 - D. lumbar.

7. Meiotic cell division is important in that it ensures that.....
- A. all parental characteristics are inherited by off springs.
 - B. disadvantageous traits are eliminated in the next generation.
 - C. variation in chromosomal number occurs among off springs.
 - D. the species' chromosomal number is not doubled after fertilisation.
8. Production of many pollen grains is an adaptation for.....
- A. cross pollination.
 - B. wind pollination.
 - C. insect pollination.
 - D. self pollination.
9. Which one of the following is NOT an adaptation of plants to reduce water loss?
- A. Fewer and smaller leaves.
 - B. Leaves reduced to spines.
 - C. Alternate leaf arrangement.
 - D. Rolled up leaves.
10. Which one of the following pairs of hormones are produced by the reproductive organs in a mammal?
- A. Oestrogen and progesterone.
 - B. Follicle stimulating hormone and testosterone.
 - C. Luteinising hormone and Oxytocin.
 - D. Testosterone and progesterone.
11. The anatomy of a plant was described as follows;
- (i) has scattered Vascular bundles.
 - (ii) cambium absent.
 - (iii) no clear demarcation between cortex and pith.
- Which one of the following suits the description above?
- A. Root of a monocotyledonous plant.
 - B. Stem of a young dicotyledonous plant.
 - C. Stem of a monocotyledonous plant.
 - D. An old dicotyledonous root.
12. In which of the following parts of a flower do gametes develop from?
- A. Stamen and pistil.
 - B. Anthers and ovary.
 - C. Receptacle and ovary.
 - D. Style and anthers .

13. In cattle, the gene for hornless is dominant over the gene for horned. If a horned bull is crossed with a heterozygous hornless cow, what is the probability of producing a horned off spring?
- A. 25%.
B. 50%.
- C. 75%.
D. 100%.
14. The rapid elongation of the epicotyls during germination causes.....
- A. delay in the emergence of photosynthetic leaves.
B. cotyledons to grow above the ground.
C. early emergence of photosynthetic leaves.
D. cotyledons to remain under the ground.
15. Which of the following structures are present in all protozoa?
- A. Pseudopodia.
B. Cilia.
- C. Flagella.
D. Vacuoles.
16. Which one of the following can cause an inheritable variation in the members of a species?
- A. Change in climate.
B. Mechanical damage.
- C. Random mating.
D. Change in habitat.
17. The main reason why there is no starch in the white region of a variegated leaf is because it
- A. is made of added cells.
B. reflects most of the light.
- C. absorbs most of the light.
D. does not contain chlorophyll.
18. A person of blood group O was involved in an accident with a great loss of blood. From a person of which blood group will it be safe to receive blood?
- A. O
B. A
- C. AB
D. B
19. In most living organisms, the respiratory gases enter and leave the body through the same passage except in.....
- A. man.
B. insects.
- C. flowering plants.
D. fish.

20. A certain species of rats produces a small volume of highly concentrated urine. Which of the following would be the most likely habitat of the rats?
- A. Savannah. C. High mountain.
B. Desert. D. Tropical rain forest.
21. Which kind of joint occurs between the femur and tibia of a human?
- A. Ball and Socket. C. Hinge joint.
B. Gliding joint. D. Fixed joint.
22. Which one of the following attaches the foetus to the mother's uterine lining?
- A. Placenta. C. Foetal membrane.
B. Spinal cord. D. Umbilical cord.
23. In which of the following parts of the eye are the cones of the retina more concentrated?
- A. Ciliary Body. C. Fovea.
B. Sclerotic Coat. D. Blind spot.
24. Aestivation occurs in animals in order to survive X while hibernation in order to survive Y
- A. X extreme cold and Y extreme temperature.
B. X drought and Y both drought and heat.
C. X extreme temperature and Y extreme cold.
D. X excessive cold and Y extreme heat.
25. An ideal membrane for Osmosis should be.....
- A. completely impermeable to solutes and completely permeable to solvents.
B. completely impermeable to solvents and completely permeable to solutes.
C. completely impermeable to both solutes and solvents.
D. completely permeable to both solutes and solvents.
26. Which of the following plays both an endocrine and digestive function?
- A. Liver and pancreas. C. Stomach and Pancreas.
B. Pancreas. D. Liver.
27. The number of chromosomes in a fertilised egg of humans that will grow into a male child is;
- A. 22 pairs +XX. C. 22 pairs +Y.
B. 22 pairs +X. D. 22 pairs +XY.

28. The flow chart below represents part of the nitrogen cycle. Which of the numbered stages represents the process of denitrification?



- A. 1
B. 2
C. 3
D. All of the above
29. Flexing of the fore arm is brought about by;
- A. relaxation of the biceps and contraction of the triceps.
B. relaxation of both biceps and triceps.
C. contraction of both biceps and triceps.
D. contraction of biceps and relaxation of triceps.
30. Biological control of cotton ball worms would involve.....
- A. spraying with insecticides.
B. burning infected cotton plants.
C. introducing predatory wasps.
D. hand picking cotton balls.

SECTION B (40 MARKS)

31. An experiment was performed to find out the effect of temperature on the rate of digestion of sucrose by an enzyme. Nine test tubes each containing an equal amount of enzyme solution were placed in separate water baths, each maintained at different temperatures for the duration of the experiment.
- After 15 minutes, the contents of each pair of test tubes were mixed. The test tubes containing the mixture were replaced in water baths. The rates of reaction were determined by finding the mass of the products formed each minute.

The results are shown in the table below.

Temperature (°C)	5	15	25	30	35	40	45	50	60
Rate of reaction (mg/minute)	0.5	1.3	2.4	3.1	3.7	4.1	4.1	2.7	0.0

- (a) Why were the enzyme and sucrose solutions separately placed in each water bath for 15 minutes before mixing? (1mk)

.....

- (b) Plot a graph using data in the table above. (7mks)

- (c) At what temperature range is the enzyme most active? (1mk)

.....

- (d) (i) Suggest a reason for the results obtained at temperature of 60°C. (1mk)

.....

- (ii) If the temperature of the mixture previously kept at 60°C was lowered to 35°C. What would you expect the results to be? Explain your answer. (2mks)

.....

- (e) (i) What products are formed by digestion of sucrose? (1mk)

.....

- (ii) Describe a chemical test to demonstrate the presence of the products named in e(i) above. (4mks)

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(iii) Name the enzyme responsible for the digestion of sucrose. (1mk)

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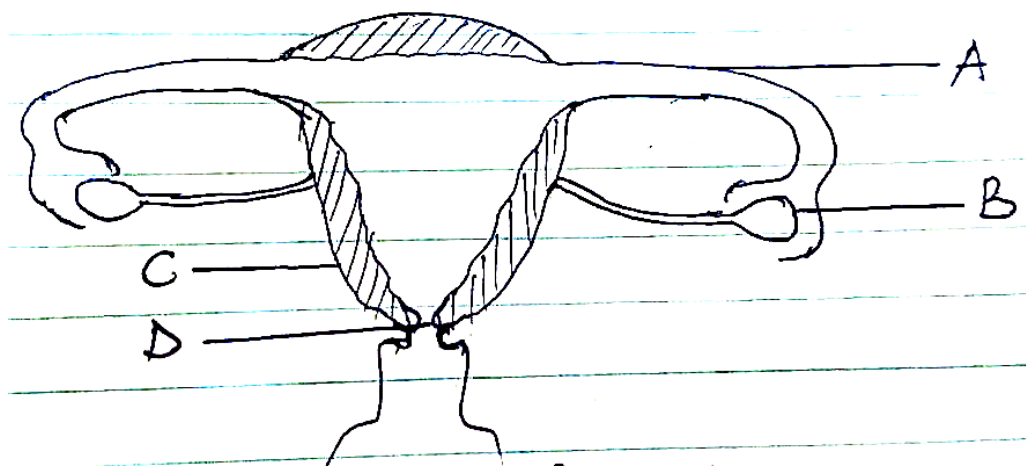
(f) Apart from temperature, state any two (2) other factors which influence the rate of enzyme activity. (2mks)

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.....

32. The diagram below shows the structure of the female reproductive system. Use it to answer the questions that follow.



(a) (i) Name the parts labeled A to D. (2 mks)

A:

B:

C:

D:

(ii) Give the functions of the parts labeled A and B. (2mks)

A.....

.....

B.....

.....

(b) Mention two ways in which structure labeled A is adapted to its function(s).

(2mks)

.....

.....

.....

.....

(c) Give any two (2) birth control methods used by couples today in Uganda (2mks)

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.....

(d) State two (2) advantages of sexual reproduction

(2mks)

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33. The table below compares the approximate concentration of certain substances in plasma, glomerular filtrate and urine.

Substance	% in plasma	% in glomerular filtrate	% in urine
Water	90	90	94
Protein	6.5	0	0
Urea	0.03	0.03	1.8
Glucose	0.1	0.1	0

(a) How would the composition of urine differ from the one in the table in case of;
(3mks)

(i) high protein diet.

.....
.....

(ii) strenuous exercise.

.....
.....

(iii) lack of insulin in the blood.

.....
.....

(b) Give a reason for the absence of:

(i) protein in glomerular filtrate.

(2 mks)

.....
.....
.....

(ii) glucose in urine.

(1 mk)

.....
.....
.....

(c) Describe how ultra filtration occurs in the nephron.

(4 mks)

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.....

SECTION C (ESSAY) 30 MARKS

Attempt any two (2) questions

34. (a) How does oxygen move from the air in the alveolus into the body tissues? (6mks)
(b) How are the respiratory surfaces suited to their functions? (4mks)
(a) Explain how anaerobic respiration is applied commercially. (5mks)
35. (a) Distinguish between germination and seed dormancy. (2mks)
(b) Give any three (3) factors that; (6mks)
(i) are required for seed germination.
(ii) cause seed dormancy.
(c) Describe the changes that occur in seed during germination. (5mks)
(d) How can seed dormancy be broken? (2mks)
36. (a) Define fruit/seed dispersal. (1mk)
(b) Explain the importance of fruit/seed dispersal. (5mks)
(c) Describe how fruits/seeds are adapted to dispersal by;
(i) animals. (5mks)
(ii) wind (4mks)
37. (a) Define the following terms. (4mks)
(i) Genotype.
(ii) Recessive gene.
(iii) Sex linked gene.
(iv) Colour blindness.
(b) Colour blind is a condition caused by a recessive gene carried on the sex chromosome. If a colour blind man married a carrier woman for colour blindness, what is the probability of producing colour blind daughter? Show your working. (11mks)

END