

Name:.....Centre/Index No:...../.....

553/1
BIOLOGY
THEORY
Paper 1
AUGUST, 2019
2½ hours



JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS AUGUST, 2019

BIOLOGY

THEORY

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Answer ALL questions in section A and B, plus any TWO questions in section C.

Answers to section A and B should be written in the spaces provided strictly.

For Examiner's Use Only

SECTION	MARKS
A: 1-30:	
B No. 31:	
No. 32:	
No. 33:	
C No. :	
No:	
TOTAL	

SECTION A (30 MARKS)

ANSWER SHEET

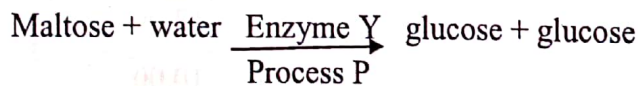
1.	11.	21.
2.	12.	22.
3.	13.	23.
4.	14.	24.
5.	15.	25.
6.	16.	26.
7.	17.	27.
8.	18.	28.
9.	19.	29.
10.	20.	30.

1. Which one of the following describes the lateral projection on a vertebra?
A. Centrum
B. Neural arch
C. Neural spine
D. Transverse process.
2. Which one of the following terms includes all others in the list?
A. Starch
B. Carbohydrate
C. Disaccharide
D. Monosaccharide
3. What is the basic function of the condenser on the light microscope?
A. Magnifies the object
B. For holding the slide in place
C. For bringing the specimen into focus
D. Concentrates light rays that pass onto the stage.

4. Which one of the following cell structures is not correctly related to its function?

STRUCTURE	FUNCTION
A: Vacuole	Allows passage of materials in and out of cells
B: Cell wall	Forms the outer boundary and supports a plant cell
C: Chloroplast	Contains chlorophyll which traps light for photosynthesis
D: Cell membrane	Controls exchange of material between a cell and its environment.

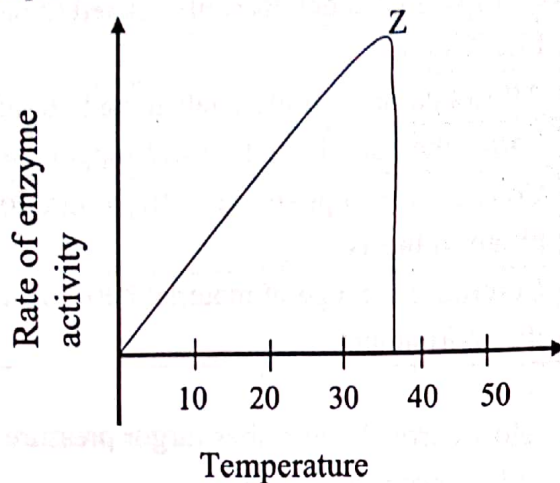
5. Which one of the statements below correctly describes turgor pressure? The...
- tendency of a solution to lose water molecules.
 - inward force developed by the cell wall in an attempt to oppose outward pressure.
 - outward force developed by the cell wall in an attempt to oppose outward pressure.
 - outward pressure exerted on the cell wall by the cytoplasm lining when a cell absorbs water by osmosis.
6. Which one of the following is the correct list of the taxonomic units in descending order?
- Species, genus, family, order, class, phylum.
 - Phylum, class, order, family, genus, species.
 - Class, phylum, order, family, genus, species
 - Genus, species, family, order, class, phylum.
7. Study the equation below.



Name enzyme Y and process P

	ENZYME	PROCESS
A:	Diastase	hydrolysis
B:	Amylase	catalysis
C:	Invertase	condensation
D:	Ptyaline	denaturation

8. Study the graph below and answer the question that follows.



What substance was introduced at point Z?

- A. Water
 - B. Cofactor
 - C. Substrate
 - D. Enzyme inhibitor
9. 1cm^3 of a catalase solution was added to hydrogen peroxide at different pH values and the time taken to collect 10cm^3 of oxygen was measured as shown below:

pH of solution	Time taken to collect gas (sec)
4.00	20.00
5.00	12.00
6.00	10.00
7.00	13.60
8.00	17.40

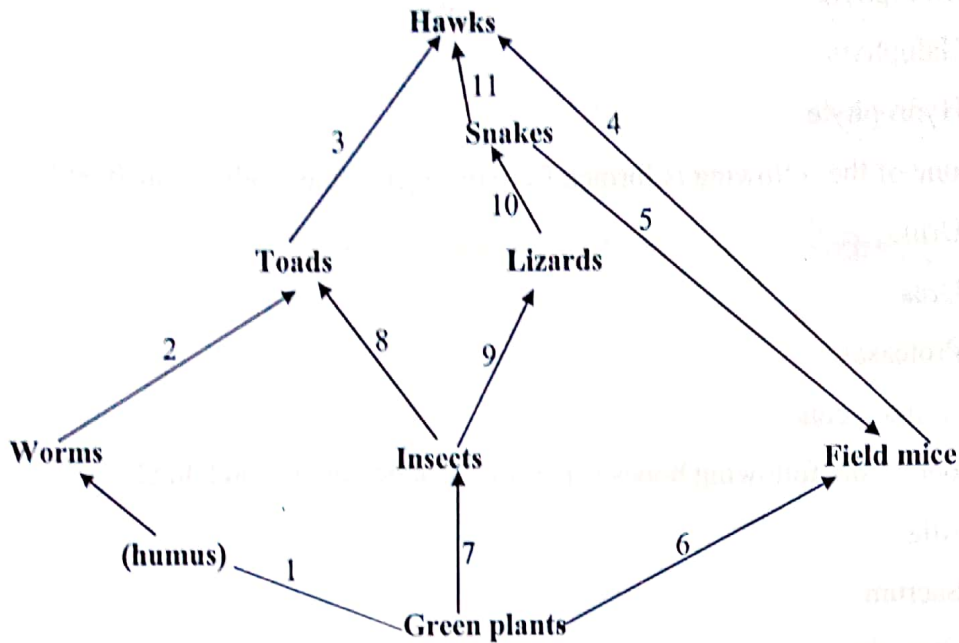
From the data above give the optimum pH.

- A. pH 4
- B. pH 5
- C. pH 6
- D. pH 7

10. Which one of the following abiotic factors has the strongest influence on the structure and functioning of an ecosystem?
- A. Wind
 - B. Light
 - C. Temperature
 - D. Water availability
11. A sudden movement of blow fly larvae away from light is an example of
- A. taxis
 - B. nasty
 - C. kinesis
 - D. tropism
12. In which one of the following gut sections is a villus found?
- A. Liver
 - B. Ileum
 - C. Stomach
 - D. Large intestine
13. Which of the following is produced in the lymph nodes?
- A. Fibrinogen
 - B. Blood platelets
 - C. Red blood cells
 - D. Some white blood cells
14. When the environmental temperature is at 12°C, which one of the following represents the temperature of the air breathed out by a mature boy?
- A. 24.0°C
 - B. 30.0°C
 - C. 37.0°C
 - D. 98.4°C

15. Which one of the following aids heat loss from the skin of a man on a hot, dry day?
- A. Hair
 - B. Subdermal fat
 - C. Sebaceous glands
 - D. Dermal blood vessels
16. In a breeding experiment, a heterozygous tall plant was crossed with a short plant. 344 plants were produced from the cross. How many of those plants were heterozygous tall?
- A. 86
 - B. 172
 - C. 258
 - D. 688
17. What is usually characteristic of the initial organism in a food chain? Being.
- A. parasitic
 - B. saprophytic
 - C. herbivorous
 - D. photosynthetic
18. Which one of the following is the least important function of humus in the soil?
- A. Water retention
 - B. Improving aeration
 - C. Increasing soil fertility
 - D. Prevention of soil erosion

19. The flow diagram below represents a food web in a community.



Which arrow is wrongly drawn?

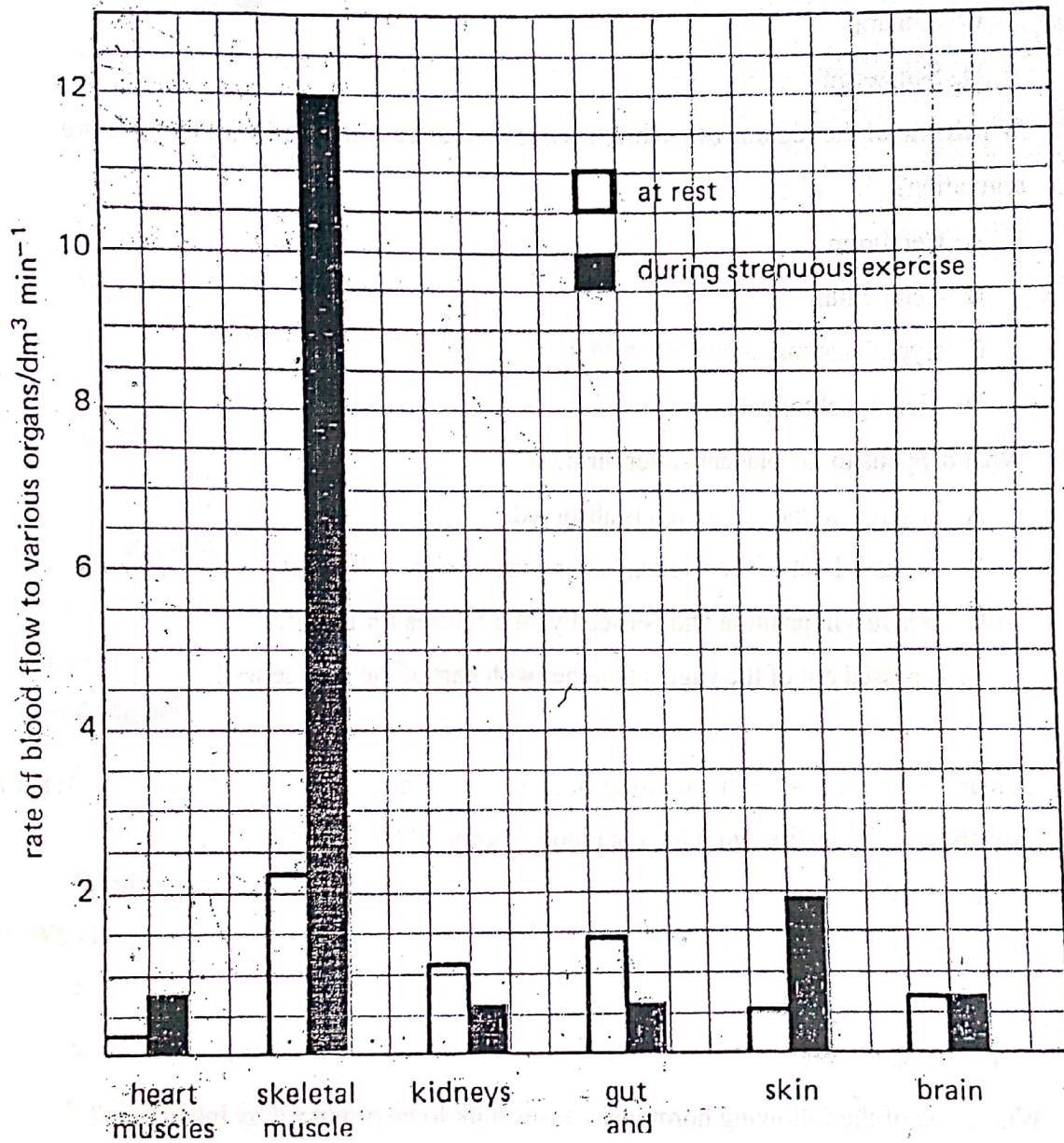
- A. 5
 - B. 7
 - C. 9
 - D. 11
20. What causes the production of copious quantities of dilute urine by a mammal?
- A. Production of ADH
 - B. Production of less insulin
 - C. Drinking too much water
 - D. Production of less vasopressin
21. Which category of plant shows the following adaptations?
- (i) Water storage tissues
 - (ii) Reduction of leaf area
 - (iii) An extensive root system
 - (iv) Sunken stomata and leaf rolling

- A. Xerophyte
 - B. Mesophyte
 - C. Halophyte
 - D. Hydrophyte
22. Which one of the following is formed from nitrogen compounds by the liver?
- A. Urine
 - B. Urea
 - C. Proteases
 - D. Amino acids
23. Which one of the following bones is part of the appendicular skeleton?
- A. Atlas
 - B. Sacrum
 - C. Clavicle
 - D. Mandible
24. Which one of the following occurs when you look up from reading a book, in shadow, in order to view a distant house on a hill? The
- A. lens becomes thicker
 - B. pupil becomes smaller
 - C. ciliary muscles contract
 - D. suspensory ligament contracts
25. Which of the following confirms that a maize grain is a fruit?
- A. It has two scars
 - B. It has a cotyledon
 - C. It contains a plumule and a radicle
 - D. The food is stored in the endosperm.

26. Which one the following is not categorised as a dry indehiscent fruit?
- A. Achene
 - B. Cypsela
 - C. Samara
 - D. Schizocarp
27. Which one of the regions of the brain is a reflex centre concerned with temperature regulation?
- A. Cerebrum
 - B. Cerebellum
 - C. Hypothalamus
 - D. Medulla oblongata
28. What happens to the placenta after birth? It
- A. remains in the uterus and is absorbed.
 - B. is passed out of the vagina, leaving the uterine wall intact
 - C. remains in position and is used by later fetuses for nutrition
 - D. is passed out of the vagina together with part of the uterine wall.
29. A man, homozygous for blood group B, marries a woman whose genotype is AB. What is the probability of their first child having blood of group AB?
- A. $33 \frac{1}{3}\%$
 - B. 50%
 - C. $66 \frac{2}{3}\%$
 - D. 100%
30. Which one of the following hormones causes milk to be produced by the breasts?
- A. Oxytocin
 - B. Oestrogen
 - C. Progesterone
 - D. Luteinising hormone

SECTION B (40 MARKS)

31. (a) The figure below is a histogram showing the rate of blood flow to various organs.



- (i) Record in the table below, the volume of blood flowing per minute to each of the organs when the body is at rest and when the body is undergoing strenuous exercise. (6 marks)

	Volume of blood / $\text{dm}^3\text{min}^{-1}$	
	At rest	During strenuous exercise
Heart muscle		
Skeletal muscle		
Kidneys		
Gut and liver		
Skin		
Brain		

- (ii) What is the total volume of blood per minute being pumped by the left ventricle to all of these organs when the body is:

at rest

.....

undergoing strenuous exercise.....

.....

(2 marks)

- (iii) If the pulse rate when the body is at rest is 70 per minute, what volume of blood is pumped out by the left ventricle at each heart beat? (2 marks)

.....

.....

- (iv) If the pulse rate during strenuous exercise is 160 per minute, what volume of blood is pumped out by the left ventricle at each heart beat? (2 marks)

.....

.....

- (v) Explain the changes in the rate of blood flow to the following organs as a result of undergoing strenuous exercise. (8 marks)

Heart muscle:.....

.....

.....

Skeletal muscle:.....

.....

.....

Kidney:.....

.....

.....

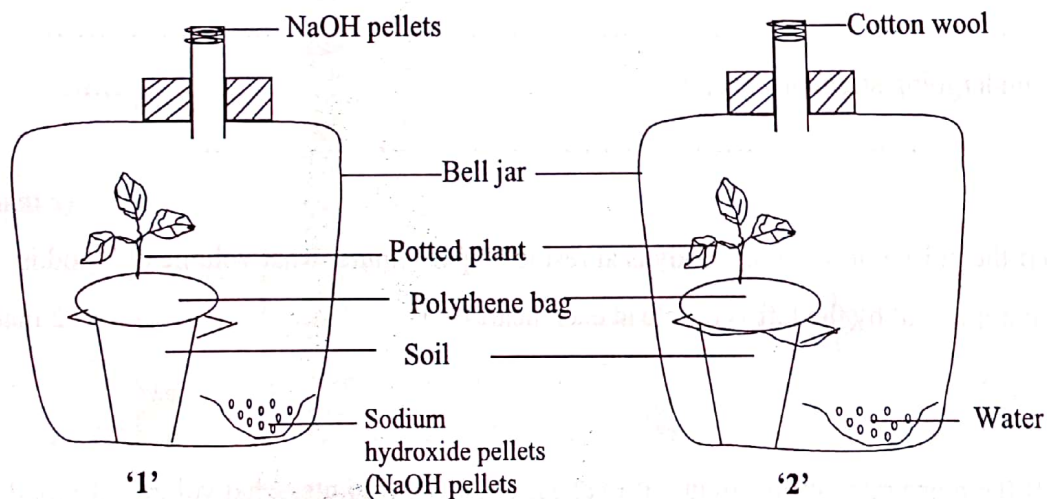
Gut and liver:.....

.....

.....

32. An experiment was set up as shown below to investigate a certain biological process.

The set up was exposed in the light



(a) State the biological process being investigated in this experiment.

(1 mark)

.....

.....

(b) State the function of sodium hydroxide, (2 marks)

(i) on the path of the incoming air.

.....
.....

(ii) inside the bell jar.

.....
.....

(c) Why were the pots covered with polythene bag? (1 mark)

.....
.....

(d) What was the need of watering the potted plant at the beginning of the experiment?

(1 mark)

.....
.....

(e) State four other factors that affect the rate of photosynthesis (4 marks)

(i).....

(ii)

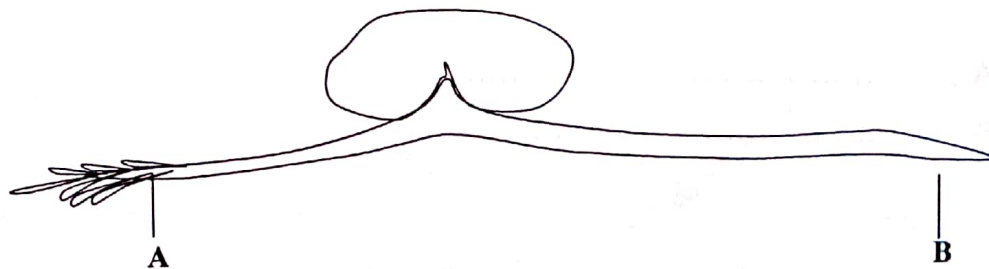
(iii).....

(iv).....

(f) In which set up would the leaf test positive for starch? (1 mark)

.....
.....

33. In an experiment set up, a seedling was placed horizontally as shown below. Study the diagram and use it to answer the questions that follow:



- (1 mark)

A.....

B.....

- (7 marks)

Blank handwriting practice lines.

- (2 marks)

(i) A.....

(ii) B.....

SECTION C (30 MARKS)

Choose and attempt any two questions.

34. Describe how the human eye is adapted to its function. (15 marks)
35. (a) Which parts of a flower constitute the non essential parts? (1 mark)
- (b) Outline the differences between the following terms: (2 marks)
- (i) Self pollination and cross pollination
- (ii) Protandry and protogyny.
- (c) Describe the series of events that lead to fertilization in a flowering plant. (12 marks)
36. (a) Draw the internal structure of the right human kidney. (3 marks)
- (b) Define the term nephron (1 mark)
- (c) Describe how the mammalian urinary system produces and excretes urine. (12 marks)
37. Describe the adaptations of the following organisms to their habitats:
- (i) Mesophytes (8 marks)
- (ii) Halophytes. (7 marks)