

MID TERM I EXAMINATIONS 2016
S.3 BIOLOGY PAPER I

TIME: 2 HOURS

INSTRUCTIONS

- ♦ *Section A and B are compulsory.*
- ♦ *Answer section A in the answer sheet provided and section B in the spaces provided.*
- ♦ *Answer any 2 questions from section C.*

SECTION A

1. Which one of the following is a correct route taken by carbon dioxide from the body cells of an insect to the atmosphere?
 - A. Trachea → tracheoles → spiracles
 - B. Spiracles → Trachea → tracheoles
 - C. Tracheoles → Trachea → Spiracles
 - D. Spiracles → Tracheoles → Trachea
2. Which one of the following enzymes acts best at low pH?
 - A. Trypsin
 - B. Lipase
 - C. Pepsin
 - D. Peptidase
3. The main function of buttress roots is to
 - A. Provide additional support
 - B. Store food for the plant
 - C. Enable the plant clasp firmly onto others
 - D. Store water for the plant
4. Which one of the following parts of the kidney actually carries out the excretory function?
 - A. Pelvis
 - B. Medulla
 - C. Nephron
 - D. Cortex
5. Which one of the following is the mode of feeding of a mould?
 - A. Saprophytic
 - B. Autotrophic
 - C. Parasitic
 - D. Holozoic
6. Which one of the following sets of events occurs in a person when feeling cold?
 - A. Blood capillaries contract, hair rises and metabolic rate increases.
 - B. Hair lowers, blood capillaries dilate and the metabolic rate decreases
 - C. Metabolic rate increases, blood capillaries dilate and hair lowers

- D. Metabolic rate decreases, blood capillaries constrict and hair rises.
7. Which one of the following is a characteristic of sandy soils?
- A. High water retention
 - B. High porosity
 - C. Low drainage
 - D. High capillarity
8. Which one of the following word equations summarizes the process of fermentation?
- A. Glucose $\longrightarrow$ Ethanol + Carbondioxide + energy
 - B. Glucose $\longrightarrow$ Lactic acid + water + carbon dioxide
 - C. Glucose $\longrightarrow$ Lactic acid + energy + water
 - D. Glucose $\longrightarrow$ Ethanol + water + carbon dioxide
9. A student heated a soil sample until it was red hot. The purpose was to
- A. Destroy humus
 - B. Remove air
 - C. Remove water
 - D. Kill micro organism
10. A maize grain has the testa of the seed fused with the pericarp of the fruit. This type of fruit is known as
- A. Caryopsis
 - B. Schizocarp
 - C. Legume
 - D. Achene
11. The structure inside a cell which regulates its activities is the
- A. Cell membrane
 - B. Nucleus
 - C. Cytoplasm
 - D. Mitochondria
12. The main difference between monocotyledonous and dicotyledonous stems is that in dicotyledonous stems
- A. The vascular bundles are distributed all over the stem
 - B. There is a wide pith
 - C. There is no cambium
 - D. The vascular bundles are arranged in a ring
13. In which parts of the alimentary canal is starch digested?
- A. Small intestine and mouth
 - B. Mouth and duodenum
 - C. Duodenum and stomach
 - D. Mouth and stomach
14. Water is conducted up a stem through the:
- A. Cambium
 - B. Phloem

- C. Xylem
- D. Pith

15. A good mammalian respiratory surface should be

- A. Dry with large surface area
- B. Moist with reduced surface area
- C. Dry with many blood vessels
- D. Moist with many blood vessels

16. Gas exchange does not take place in

- A. Alveoli
- B. Brundiocles
- C. Tracheoles
- D. Gill filaments

17. During the formation of urine in mammals the event which takes place between the glomerulus and the Bowman's capsule is

- A. ultra filtration
- B. selective re-absorption
- C. osmosis
- D. absorption

18. Undigested remains in the gut are not excretory products because they

- A. Do not pass through the kidneys
- B. Do not pass out in fluid form
- C. Have not participated in body metabolism
- D. Are not acted upon by enzymes

19. Heat can be gained from or lost to an organism's environment in a number of ways

By which of the following methods can heat only be lost?

- A. Radiation
- B. Conduction
- C. Evaporation
- D. Convection

20. Which of the following parts connects the bladder with the outside?

- A. Uterus
- B. Urethra
- C. Ureters
- D. Oviducts

21. When testing for non-reducing sugars, dilute hydrochloric acid is used to

- A. neutralize excess sodium hydroxide
- B. break down the sugar
- C. makes the colour changes clearly visible
- D. create an acidic PH

22. Terrestrial plants are adapted to water shortage by having

- A. Thin permeable cuticle
- B. poorly developed vascular tissue
- C. more stomata on upper surface of leaves
- D. reduced leaf surface area.

☐

23. Which one of the following arthropods is wingless with two body parts?

- A. tick
- B. spider
- C. sugar ant
- D. termite.

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24. Which one of the following sets of conditions can occur at the same time in a mammalian body?

- A. vasodilation, increased sweating and contraction of erector Pilli muscle
- B. vasodilation, increased sweating and increased metabolic rate
- C. increased sweating, vasodilatation and relaxation of erector Pilli muscle
- D. vasodilatation, reduced metabolic rate and relaxation of erector Pilli muscle

25. Which one of the following represents the power of the eyepiece of a microscope whose magnification of a specimen is 400 times using an objective lens marked X40?

- A. X400
- B. B. X40
- C. C. X10
- D. X100

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26. In an investigation to find the volume of air in a soil sample, the following results were obtained:

Volume of tin used to measure soil	= $x \text{ cm}^3$
Volume of water + soil	= $y \text{ cm}^3$
Volume of water put in measuring cylinder	= 200 cm^3
Volume of solid matter in soil used	= $y - 200 \text{ cm}^3$
What would be the volume of air in soil?	

☐

- A. $X + (y-200)\text{cm}^3$
- B. $X - (y-200)\text{cm}^3$
- C. $Y - (x+200) \text{ cm}^3$
- D. $(y-x) \text{ cm}^3$

27. The deficiency disease rickets is due to lack of element

- A. phosphorus
- B. iodine
- C. iron
- D. nitrogen

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28. The part of the microscope used to make the image clear is the
a. Objectives lens

- b. Eye piece
- c. Coarse adjustment knob
- d. Fine adjustment knob

29. Mosquitoes can be most effectively controlled by:

- A. sensitizing community members about dangers of mosquitoes
- B. smearing with mosquito repellent body cream every night
- C. destroying the mosquitoes' breeding ground
- D. sleeping under mosquito nets



30. The earthworm belongs to the phylum annelida as the grasshopper belongs to the phylum

- a. Orthoptera
- b. Mollusca
- c. Insecta
- d. Arthropoda

ANSWER GRID FOR SECTION A

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

SECTION B:

31. A biologist collected data from an athlete after a period of running. The following table shows his data

Running time (in minutes)	Concentration of lactic acid in blood (mg/100 cm ³)
0	3
2	10
4	28
6	45
8	50
10	44
12	40
14	36
16	33
18	30
20	26
30	12
40	8
50	5
60	3
65	3

a) Using the above data, draw a suitable graph.

b) i) Where in the human body is lactic acid produced during exercise?

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ii) During which process was lactic acid produced?

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c) i) Which period on the graph shows the period of recovery?

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d) What happens to lactic acid during the recovery period?

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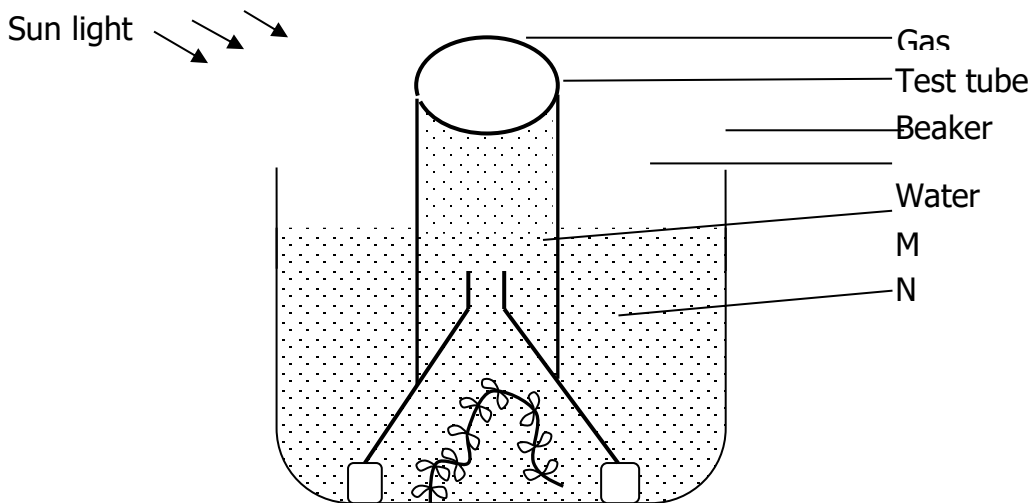
e) What are the effects of excessive accumulation of lactic acid?

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32. A student set an experiment as shown in the figure 4 below. Study it and answer questions that follow.



a) What was the intention of the student in this experiment set up? (01 mark)

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b) Give the importance of parts marked M and N in the experiment (02 marks)

M.....

N.....

c) i. State the possible products in this experiment. (02 marks)

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ii. How would you prove the identity of the products of the experiment in the figure 4 above? (02 marks)

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iii. Give the importance of sunlight in the experiment in figure 4 above. (01 mark)

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d) Suggest any two roles of the products of the experiment to humans. (02 marks)

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32. a) Complete the following table by naming the form of nitrogenous excretory products and the main excretory organ used by the respective animal or groups of animals.

	Animals	Nitrogenous excretory product	Excretory organ
i)	Birds		
ii)	Fresh water bony fish		
iii)	Insects		

b) Gove a reason (advantage) for the form of excretory product you have mentioned in (a) above for:

i) Birds

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ii) Fresh water bony fish

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SECTION C:
Answer any two questions

33. a) State the ways by which the mammalian body :
- i) regulates blood sugar
 - ii) regulates water
- b) Explain how the kidney forms urine.
34. a) Describe the mechanism of ventilation in lungs..
- b) "Tabulate" the differences between
- i. Aerobic and Anaerobic respiration
 - ii. Photosynthesis and respiration
35. a) Describe the life cycle of a mosquito.
- b) Explain why insects are considered to be more successful.

****END****