

CANDIDATE'S NAME.....

NAME OF SCHOOL.....SIGN.....

P530|1
BIOLOGY (THEORY)
PAPER 1
JULY/AUGUST 2023
2½ HOURS.



NATIONAL EDUCATION RESEARCH & EXAMINATIONS BUREAU

UACE NEREB NATIONAL MOCKS 2023

BIOLOGY (THEORY)

PAPER ONE

2 HOURS 30 MINUTES.

INSTRUCTIONS TO CANDIDATES:

- This paper consists of sections A and B.
- Answer *all* questions in both sections
- Answers to questions in section A should be written in the boxes provided.
- Answers to questions in section B should be written in the spaces provided.

FOR EXAMINER'S USE ONLY		
SECTION		MARKS
A: 1 - 40		EXAMINER'S INITIALS
B:	41	
	42	
	43	
	44	
	45	
	46	
TOTAL		

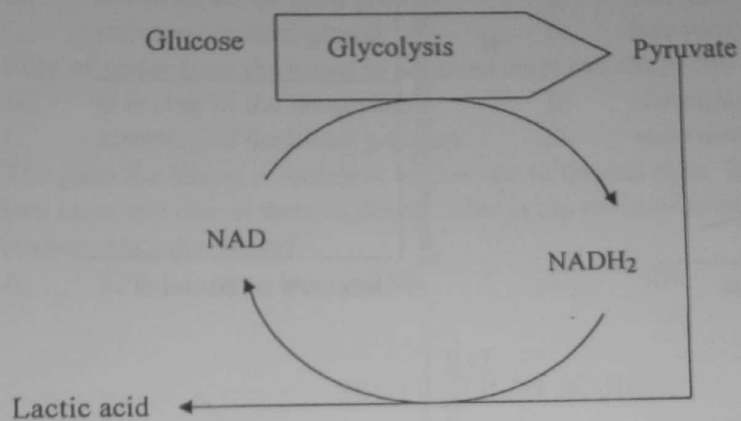
SECTION A

1. Muscle contraction is attributed to action of
 - A. microtubules
 - B. micro filaments
 - C. intermediate filaments
 - D. myosin and tubule proteins
2. Which one is least affected by disruption of hydrogen bonds?
 - A. tertiary level protein
 - B. primary level proteins
 - C. secondary level protein
 - D. quaternary level proteins
3. The following are part of endomembrane system except
 - A. plasma membrane
 - B. nuclear membrane
 - C. golgi apparatus
 - D. chloroplast
4. Genetic variation in a population is maintained by
 - A. stabilizing selection
 - B. directional selection
 - C. balancing selection
 - D. disruptive selection
5. Transmission of impulse along an axon is stopped by temperature. This is because higher temperature stop
 - A. production of air required to conduct impulse
 - B. diffusion of ions along the axo membrane
 - C. diffusion of ions across axomembrane
 - D. production of ATP required to restore resting potential
6. How is photosynthesis similar in C₄ and CAM plants?
 - A. only photosystem I is used
 - B. rubisco is not used to fix carbon initially
 - C. make sugar without Calvin cycle
 - D. thylakoids are not involved in photosynthesis
7. Which of the following does not occur during mitosis?
 - A. replication of DNA
 - B. spindle formation
 - C. separation of sister chromatids
 - D. condensation of chromosomes
8. Which life cycle stage is found in plants but not animals?
 - A. gamete
 - B. unicellular diploid
 - C. multi cellular diploid
 - D. multi cellular haploid

9. Complete removal of calcium ions from the fluid surrounding a neuron would stop transmission of information
 - A. between but accept within a neuron
 - B. within and between neurons
 - C. within but accept between neurons
 - D. within excited neurons
10. In analyzing the number of different bases in a DNA sample, which result would be consistent with the base pairing rules?
 - A. $A + G = C + T$
 - B. $A = C$
 - C. $A + T = G + T$
 - D. $A = G$
11. The energy for jogging a few hours after lunch is provided by stored fuel of
 - A. muscle protein
 - B. fat stored in liver
 - C. blood sugar
 - D. muscle and liver glycogen
12. Pulse is a direct measure of
 - A. blood pressure
 - B. heart beat
 - C. stroke volume
 - D. cardiac output
13. In negative pressure breathing, inhalation results from
 - A. high pressure forcing air in through the wide pipe
 - B. low pressure resulting from relaxation of rib cage muscle
 - C. low pressure resulting from contraction of diaphragm
 - D. expansion of alveoli as lung muscle expand
14. Long term immunity is provided by
 - A. mother's antibodies into developing fetus
 - B. injection of serum from a person immune to rabies
 - C. breast feeding the baby
 - D. injection of a vaccine
15. The amount of progesterone in blood increases steadily from ovulation to menstruation. Then it begins to decrease due to
 - A. implantation of a zygote
 - B. luteinizing hormone inhibits its production
 - C. its wash away by blood during menstruation
 - D. completion of its work of repairing the uterine wall
16. The lower lethal temperature of a desert mammal is higher than that of a mammal in cold places because a desert mammal has
 - A. poor mechanism of insulatia
 - B. thick fur
 - C. small extremities
 - D. a small surface area : volume ratio
17. In ecological study 140 rats were collided, marked and released to the same area. After 14 days 140 rats were captured from same region of 50 of them carried the mark. The estimated population of rats in that area is
 - A. 392
 - B. 143
 - C. 50
 - D. 280
18. The development of different limbs modified for different modes of locomotion is referred to as
 - A. development of analogues structures
 - B. convergent evolution
 - C. divergent evolution
 - D. speciation
19. Cortex is a primary tissue in plants that develops from
 - A. protoderm
 - B. proto xylem
 - C. ground meristem
 - D. procambium

20. Which of the following is true about non competitive inhibition in enzyme catalysed reaction?
- the inhibitor has a similar structure and chemical composition with substrate
 - the degree of inhibition decreases with increase in substrate concentration
 - the shape of the enzyme is not affected by inhibition
 - the degree of inhibition is independent of the substrate concentration
21. Threshold value of post synaptic membrane can be shortened by the ligand causing opening of protein channels for
- both sodium and potassium ions
 - only potassium ions
 - both potassium and chloride ions
 - only chloride ions
22. Which one of the following is not a role of water in photosynthesis?
- donates electrons
 - production of NADPH
 - production of oxygen
 - reduction of PGA to GP
23. Which one of the following is the evidence of base pairing rules in DNA double strands helix structure?
- diameter between strands is not uniform
 - diameter between strands is uniform
 - percentage composition of A is not equal that of T
 - the strands are antiparallel.
24. HIV vaccine has been difficult to develop because of the virus's
- ability to suppress immune system
 - size being very small
 - high rate of mutation
 - long latent period
25. In spermatogenesis
- cytokinesis is equal
 - cytokinesis is unequal
 - gametes mature in a continuous sequence
 - mitotic division is completed before birth
26. Flooding of garden soil increases activities of
- decomposition
 - nitrification
 - denitrification
 - nitrogen fixation
27. Auxins are always used in selective weeding on lawns because
- auxins always kill dicotyledonous plants
 - they can be manufactured artificially
 - auxins remain on the vegetation long after application
 - some dosage of auxins affects different plant parts differently

28. The figure 1 below is a simple illustration of respiration in animals



Which compound in figure 1 above share the role with oxygen during respiration?

- A. lactic acid B. pyruvate
C. glucose D. NADH_2

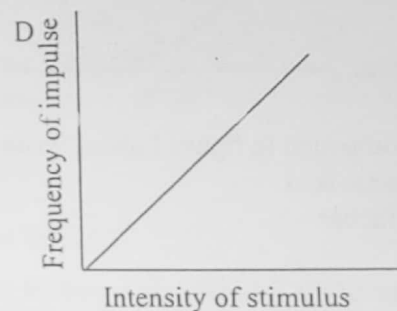
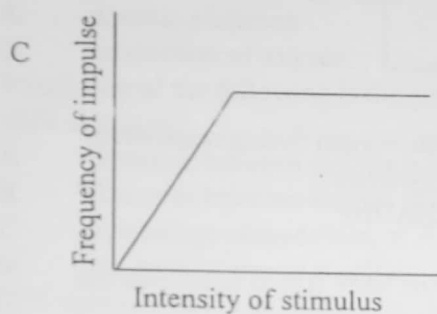
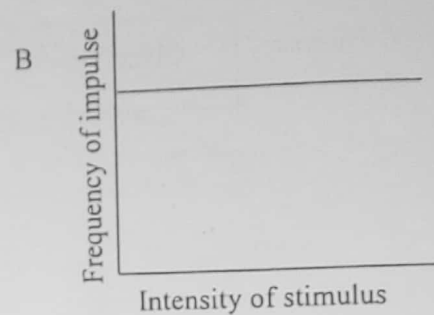
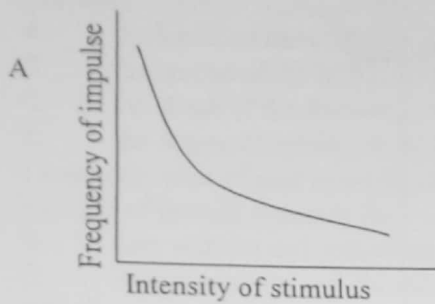
29. Which one of the following is a method used by marine body fish to overcome the problem of possessing fluids that are hypotonic to its surroundings?

- A. retention of urea
- B. increase in glomerular filtrate
- C. extensive reabsorption of salts
- D. elimination of non-toxic nitrogenous wastes

30. Imprinting can be described as
- A. learning that occurs at a critical period in early development
 - B. a behavior that involves recognizing a print mark
 - C. an innate behavior that requires practice
 - D. learning that requires a sign stimulus

31. Saturated fatty acids and unsaturated fatty acids are similar in
- A. the number of hydrogen atoms they contain
 - B. their consistence at room temperature
 - C. the number of oxygen atoms present
 - D. the number of carbon bonds they possess

32. Which one of the following graphs shows the correct relationship between the frequency action potential with increase in intensity of the stimulus?



33. In heavily polluted aquatic ecosystem, the group of organisms with the highest concentration of pollutant in their bodies are the
- A. secondary consumer B. tertiary consumer
C. primary consumer D. primary producers
34. During photosynthesis, the carbon fixing compound is produced from
- A. glyceralate - 3 - phosphate B. glucose
C. triose phosphate D. unstable 6-carbon sugar
35. The affinity of haemoglobin for oxygen is reduced by
- A. high temperature and low metabolism
B. low temperature and high metabolism
C. exercise and low metabolism
D. exercise and high metabolism
36. Low levels of abscissic acid may cause
- A. early germination of seeds B. prolonged seed dormancy
C. loss of seed viability D. early development of seeds
37. Which one of the following couples is likely to produce a foetus suffering from fetal erythroblastosis?
- A. Rh⁺ mother and Rh⁻ father B. Rh⁻ mother and Rh⁻ father
C. Rh⁺ mother and Rh⁺ father D. Rh⁻ mother and Rh⁺ father

38. Which one of the following is true about the environment of a forest floor under a thick canopy?
- | | |
|--------------------------------|-------------------------------------|
| A. develops dense plant growth | B. has heavy soil erosion |
| C. receives for reed growth | D. has wide temperature fluctuation |
39. Loss of water from the blood in a human body can result into
- | | |
|-----------------------------------|------------------------------------|
| A. lowering of the temperature | B. slow down the rate of breathing |
| C. lowering of the blood pressure | D. slow down of the heart beat |
40. The gene for albino is recessive to that one of normal skin. If normal parents produced two boys and one of them is albino, what is the probability of the second born being a homozygous dominant?
- | | | | |
|--------|--------|--------|--------|
| A. 33% | B. 25% | C. 50% | D. 10% |
|--------|--------|--------|--------|

SECTION B (60 MARKS)

Write answers in spaces provided.

- 41(a) Explain how constant resting potential of axo membrane is maintained despite of the membrane being more permeable to potassium ions (02marks)

.....

.....

- (b) With a reason explain what happens to excitability of a resting axoplasm when it is subjected to chemicals that increase its permeability to few;

- (i) sodium ions (03marks)

.....

.....

- (ii) potassium ions (03marks)

.....

.....

- (c) Explain how temperature affects conductance of an impulse along an axon. (02marks)

.....

.....

.....

42a(i) What is the role of the control centres in an effective homeostasis control system of a mammal? (03marks)

.....

.....

.....

(ii) Explain why unicellular animals do not need a homeostatic control centre. (03marks)

.....

.....

.....

(b) Explain the significance of the following process in mammals

(i) Counter current multiplier system (02marks)

.....

.....

(ii) Counter current heat exchange (02marks)

.....

.....

43(a) What is a bohr shift? (02marks)

.....

.....

(b) What is the significance of the following characteristics a red blood cell to mammal?

(i) lack of a nucleus (02marks)

.....

.....

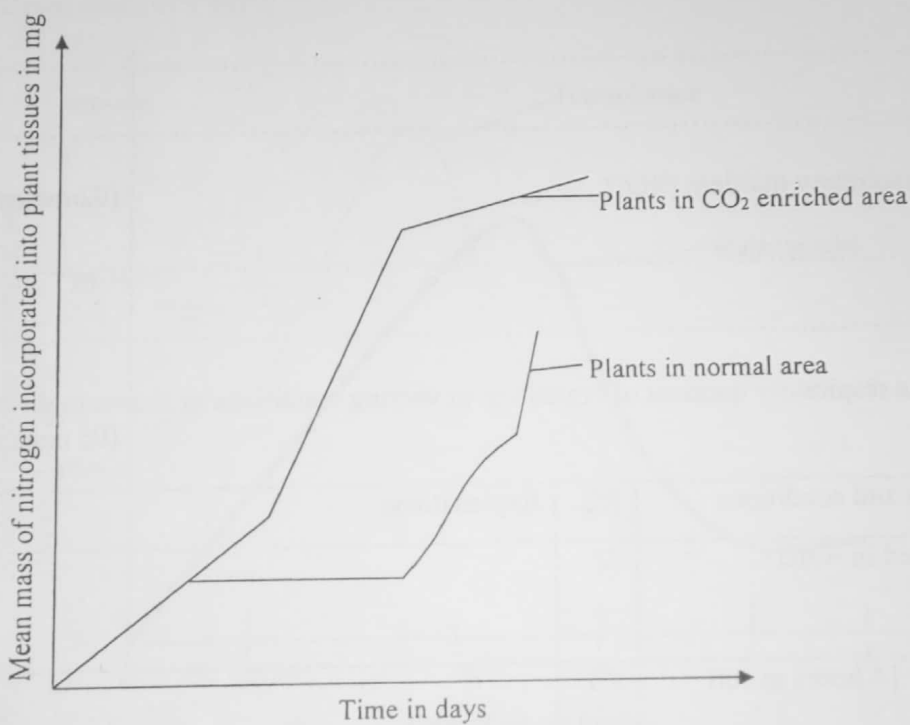
(ii) lack of mitochondria

(03marks)

(c) What is the role of bohr shift to mammals?

(03marks)

44. The graph below shows how nitrogen uptake by two groups of soya bean seedlings grown in environment of different carbondioxide concentration varies with time



(a) Give differences in uptake of nitrogen in the two groups of plants. (04marks)

- (b) Explain the high up take of nitrogen in plants grown in carbondioxide enriched environment. (04marks)

.....

.....

.....

.....

- (c) Explain the effect of reduced soil aeration in nature. (02marks)

.....

.....

.....

.....

- 45a(i) What is respiratory quotient (RQ)? (02marks)

.....

.....

- (ii) Explain the respiratory quotient of organisms in varying conditions as shown in the table below. (05 marks)

Organisms and conditions	RQ	Explanations
Seeds staked in water	72	
Seeds after 14 hours in soil	1.5	
Resting Mediterranean free frog	0.85	

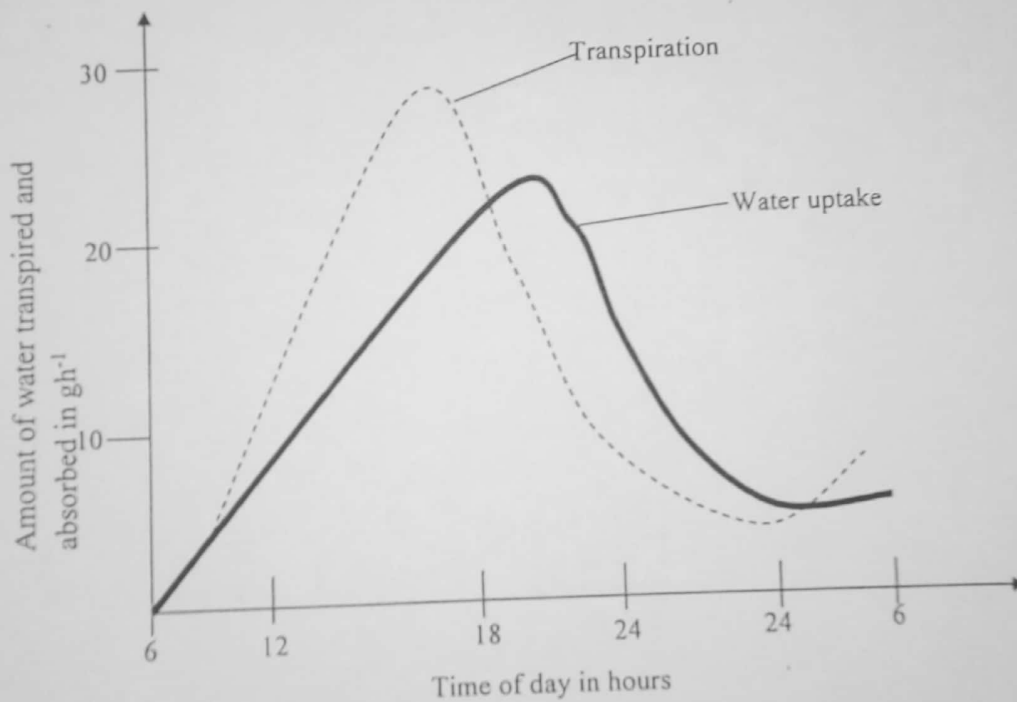
b) Explain why;

i) different protein molecules have varying RQS.

(01mark)

(ii) RQ is not accurate in determining the nature of substrate being respired. (02marks)

46. The graph below shows the rate of transpiration and rate of water uptake of a plant at different times of a day



- (a) Compare the effect of varying time of a day to the rate of transpiration and water uptake. (05marks)

.....

.....

.....

.....

.....

- (b) Explain the relationship between the rate of transpiration and water uptake. (05marks)

.....

.....

.....

.....

.....

.....

END