MWALIMU EXAMINATIONS BUREAU

UACE PRE-MOCK RESOURCE EXAMINATIONS 2016

S.6 BIOLOGY P1 MARKING GUIDE

SECTION A

1. The cell structure lacking elaborate internal structure is the
   A. mitochondrion.
   B. centriole.
   C. lysosome.
   D. endoplasmic reticulum.

   C

2. Movement of ions and large polar modules across the plasma membrane is repelled by
   A. cholesterol.
   B. glycolipid.
   C. phospholipids.
   D. channel protein.

   B

3. The biological role of protein depends on
   A. the sequence of amino acids.
   B. pattern of folding of amino acids.
   C. other protein molecules with which it is associated.
   D. its three dimensional shape.

   D

4. The most important factor determining how much oxygen is carried by hemoglobin is the
   A. level of oxygen in blood.
   B. level of carbon dioxide in the blood.
   C. temperature of the blood.
   D. level of Ca^{2+} ions in the blood.

   B

5. Which of the following is not an adaption for photosynthesis in shade plants?
   A. High chlorophyll content.
   B. Thin leaves.
   C. Low compensation point.
   D. Thick leaves.

   D

6. A homeostatic role of the gut is removal of
   A. sater.
   B. salts.
   C. bile pigments.
   D. undigested food.

   D

7. Which of these represents the proper sequence of human teeth from the front to the back of the mouth?
   A. 2 incisors, 1 canine, 3 Premolars, 3 molars.
   B. 2 incisors, 1 canine, 2 premolars, 3 molars.
   C. 3 incisors, 1 canine, 2 premolars, 2 molars.
   D. 2 incisors, 3 canines, 2 premolars, 3 molars.

   B

8. Which of these is the most efficient method of minimizing water loss in terrestrial animals?

A. Burrowing in the desert frog.
B. Waxy chitinous exoskeletons in insects.
C. Humidity seeking behaviours in wood lice.
D. Thick fur in Kangaroos.

B

9. Mammals whose limbs have short thick bones are most likely adapted for support and
A. slow locomotion.
B. jumping.
C. running.
D. climbing.

A

10. Release of milk in a lactating mother is aided by
A. protein only.
B. Oxytocin only.
C. both prolactin acid.
D. Oestrogen.

B

11. Carbon dioxide in the red blood corpuscles is carried as
A. carbamino compound.
B. Carboxyhaemoglobin.
C. haemoglobic acid.
D. carbonic anhydrase.

A

12. How does blood in the pulmonary artery of the foetus compare with that in the pulmonary artery of the adult?
A. It has higher oxygen content.
B. It has a lower oxygen content.
C. It has a similar oxygen content.
D. Its oxygen content fluctuates above and below that of the adult.

A

13. Walls of plant cells are largely composed of polysaccharides and proteins that are synthesized
A. externally to the plasma membrane.
B. in the smooth endoplasmic reticulum.
C. in the golgi apparatus.
D. in both the rough endoplasmic recticulum and golgi apparatus.

D

14. Which of the following is not a distinct feature of meiosis?
A. Pairing and exchange of genetic material between homologous chromosomes.
B. Attachment of chromosomes to the spindle.
C. Movement of sister chromatids to the same pole.
D. Suppression of NDA replication.

D

15. Which of the following does not determine the position of an animal within a pecking order?
A. Aggressiveness
B. Size of the animals
C. Fitness of the animal
D. Genetic vigour of the animal

D

16. Which of the following is a control plant tissue?
    A. Parenchyma
    B. Xylem
    C. Epidermis
    D. Collenchyma.

    B

17. Which of the following is a physiological adaptation of flowering plants to minimize water loss?
    A. Leaf orientation.
    B. Reversal of stomatal rhythm.
    C. Periodic shading of leaves.
    D. Folding of leaves.

    B

18. The human cardiac muscle has a relatively longer refractory period to prevent it from
    A. contracting strongly.
    B. pumping a lot of blood to the body.
    C. developing tetanus.
    D. developing an oxygen debt.

    C

19. Which of the following classes is the most successful in a terrestrial environment?
    A. Diplopoda
    B. Arachnida
    C. Chilopoda
    D. Insect

    D

20. All DNA that function in protection synthesis
    A. are transcribed from a DNA template.
    B. are stable and long-lived.
    C. possesses either codons or anti codons.
    D. are double stranded.

    D

21. Which of the following organisms is the most efficient at packaging nitrogen for excretion?
    A. Frog.
    B. Fresh water fish.
    C. Iguana lizard.
    D. Camel.

    C

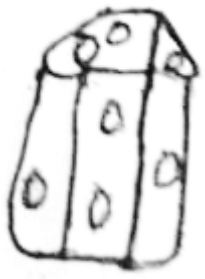
22. Which part of the Weinberg equation represents individuals who have at least one allele for sickle cell-anemia?
    A. 2pq
    B. P^2+2pq
    C. $2pq +q^2$
    D. p^2+q^2

    C

23. Which of these situations has no immediate effect on body metabolism?
    A. Increase in body temperature.
    B. Acclimatization.
    C. Release of thyroxine.
    D. Support and storage.

    B

24. The figure below represents a plant structure



Its function is to
A. transport.
C. support and transport.

C

B. support only. D. support and storage.

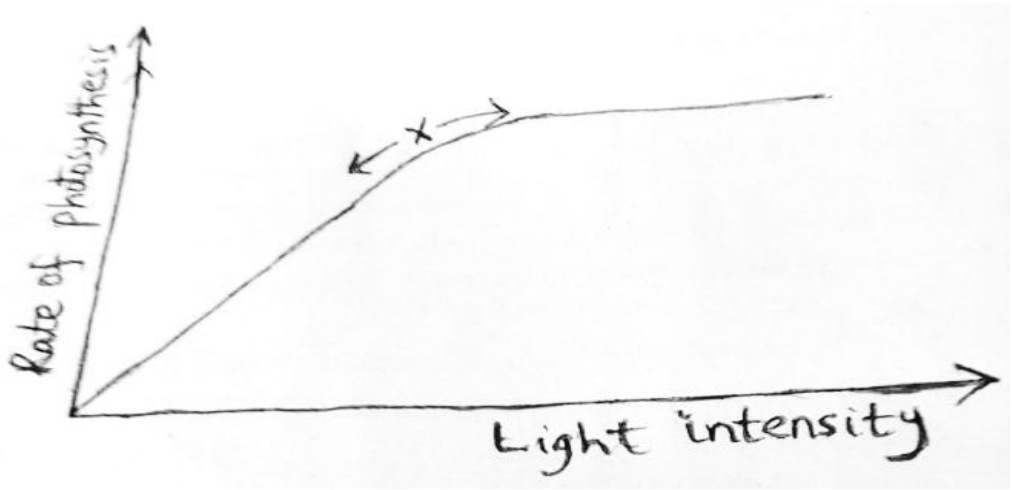
25. All receptors would exhibit the following except
    A. secretion of neurotransmitter.
    B. production of an action potential from a buildup of generator potentials.
    C. production of a generator potential as a result of stimulation.
    D. an all or none response.

A

26. The final acceptor of hydrogen in anaerobic cell respiration in plants is
    A. ethanol
    B. NAD
    C. Pyruvate
    D. luctate

A

27.



In region marked X,

    A. light intensity is the limiting factor.
    B. light is not the limiting factor.
    C. both light and other factors are limiting.
    D. a factor other than lights is the limiting factor.

C

28. In dry conditions, Spirogyra reproduces by
    A. conjugation. C. fragmentation.
    B. sporulation. D. budding.

B

29. Continuous variation is as result of
    A. dominant genes C. polygenes
    B. codominant genes D. recessive genes

C

30. In C_4 plants, the initial fixation of carbon dioxide into oxaloacetate occurs in

C

A. bundle sheath cells
B. outer ring of mesophyll cells
C. palisade cells
D. inner smaller ring of mesophyll cells

31. Which of the following is true about mosaic model of the plasma membrane?
A. The less saturated the fatty acids tails of the phospholipids, the more fluid the membrane.
B. The less unsaturated the fatty acid tails of the phospholipids, the less fluid the membrane.
C. The higher the temperature, the less fluid the membrane.
D. The lower the temperature, the more fluid the membrane.

A/B

32. A paramecium is able to avoid obstacles in its path because its

D

A. sense organs receive responses.
B. contractile vacuole bursts.
C. flagellum moves away.
D. protoplasm has the property of irritability.

33. Which of these is not a major function of liquids in the body? Lipids

A

A. are short term energy stores.
B. are long term energy stores.
C. synthesizes hormones.
D. are insulators.

34. The total amount of energy available to a second class consumer will change if
A. second order consumers are removed.
B. higher light intensity is provided.
C. all third order consumers are removed.
D. a constant biomass of producer is a maintained.

B

35. The female butterfly *Hypolimnas missipus* occurs in different forms. This is an illustration of

A

A. polymorphism
B. mimicry
C. sexual dimorphism
D. camouflage

36. The absorption of amino acids after eating a heavy proteineous meal is aided by

A

A. diffusion and active transport.
B. osmosis and diffusion.
C. diffusion and pinocytosis.
D. active transport only.

37. Birds reared by a foster mother of another species later attempts to mate with birds of the foster mother's species. This is a result of;

C

A. simple reflex.
B. conditioned reflex.
C. imprinting.
D. trial and error.

38. The enzyme that catalyzes the rearrangement of molecular structure by addition of molecules are called

A

A. Transferases.
B. Oxidoreductases.
C. Isomerases.
D. Ligases.

39. Protein synthesis will not occur in a cell lacking

A. nucleoli and ribosome.
B. ribosome and nucleoplasm.
C. nuclei and nucleoplasm.
D. endoplasmic reticulum.

B

40. Uniform dispersion patterns in plants are most often associated with

A. chance.
B. patterns of high humidity.
C. random distribution of seeds.
D. competitive interaction between individuals of same species.

D

SECTION B

41. (a) **What is a target cell?** (1 mark)

A cell in which a particular hormone exerts its influence and has specific protein receptors to interact with the hormone/ cell that responds to a specific hormone.

(b) State **four** differences in the action of peptide hormones from steroid hormones. (4 marks)

Peptide hormones	**Steroids hormones**
• Binds with opecitic receptor site 7 outside cell membrane.	penetrate the cell membrane.
• **Attaches** to Adenyl cyclase.	Combine with a receptor protein.
• Remain in cytoplasm.	Goes into the nucleus.
• Adenyl cyclase changes ATP into cyclic AMP	Attaches to DNA
• Cyclic AMP activates specific enzyme.	DNA instructs the specific enzyme.

(c) (i) **Explain why a person can live a normal life without a gall bladder.** (3 marks)

- Bile does not contain digestive enzyme**;** lipids will continue to be digested by lipase in pancreas and intestinal juice**;** through slowly.

(ii) **State four substances that make their way through the small intestine without being digested.** (2 marks)

- Mineral salts
- Vitamins
- Water
- Glucose

42. (a) S**tate four differences between primary and secondary succession** (4 marks)

Primary	**Secondary**
• Requires soil formation	Soil already formed
• Lacks seeds spores	Has seeds and spores
• Takes long to reach	Take long to reach
• Climax community	Climax community
• Pioneer community in lichens gross	pioneer community in herbs and

Any 4

(b) **State three effects of living organisms on the abiotic environment during primary succession.** (3 marks)

- Trap water e.g lichens
- Lichens break up rocks to form soil
- Lichens and masses die to form humus
- Creating greater water retention
- Accumulation of mineral salts

Any 3

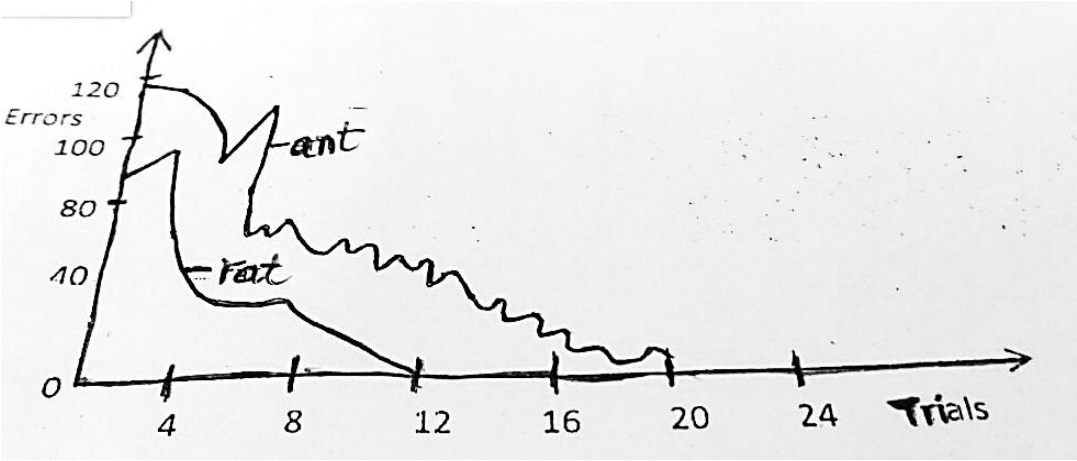
(c) **Explain the competitive exclusion principle.** (3 marks)

- When two species of organism occupy the same habitat, and same ecological niche**;** the most adapted will survive and multiply**;** the less adapted will be removed from the habitat.

43. (a) **What is trial and error learning?** (2 marks)

Is a learning through several attempts to solve a problem and level of performance determined;

(b) The **figure 3** shows the behavioral response by a rat and an ant when learning a new maze by trial and error.



What conclusions about learning in rats and ants are evident from the data in figure 3?

(4 marks)

- As the number of trail increases in ants and rat, number of errors decrease
- At any time of trails the rats have less error than ants.
- In the beginning of experiment the ants have a higher percentage of errors.
- Rats take shorter number of trails than ants to learn the maze/ to eliminate errors.

(c**) State three factors that could affect the learning of a new situation like amaze in animals**?

(3 marks)

- The size of reward or punishments
- The state of development of the brain
- The state of development of sense organs
- The complexity of the mazes

(d) **State any similarity between trial and error learning and conditioning.** (1mark)

- Both are centered on reward or punishment.
- Both involve replanted stimulation/situations

44. (a) State the physiological importance of the following structural components of the plasma membrane.

(i). **Proteins** (3 marks)

- Carriers in active substances
- Carriers in facilitate diffusion
- Act as enzymes
- Specific receptor molecules
- Election carries
- Energy transducers
- Have pores for passage of water

Any 3

(ii). **Carbohydrates** (2 marks)

- Recognition features for biding cells into tissues
- Recognition of antigens from other antigens
- May formed /act as antigens

Any 2

(b) **Explain why lipid soluble molecules diffuse more rapidly through membranes than lipid insoluble molecules.** (3 marks)

- This is because the cell membrane is made up of a **double**; **phospholipids** layer; in which globular proteins are **scattered**; molecules insoluble in lipids are repelled by phospholipids

Max 3

45. (a) **What is meant by the term gestation.** (1 mark)

- A period between conception of pregnancy and both of an animal.

b (i) **State four major changes in the circulatory system of the fetus at birth.** (4 marks)

- Umbilical circulation is discontinued

- ductus venosus closes
- ductus arterionus closes
- Foramen ovule closes
- Mesentery and hepatic portal vein begins
- Pulmonary circulation begins

(ii). **What are the significances of the post-natal circulatory changes in the human being?**

(2marks)

- Baby must get oxygen from lungs rather than placental attachment.
- Baby must get nutrients from its own alimentary canal rather than from placental attachment.

(c) **How is the structure of the foctus adapted for the different means of transport of materials across it?** (3 marks)

- Has placenta in close association with endometrium
- Placenta has many capillaries to bring deoxygenated blood and take up oxygen.
- Placenta has villi to increase the surface area for absorption/exchange of materials.
- Placental membrane thin to reduce diffusion distance

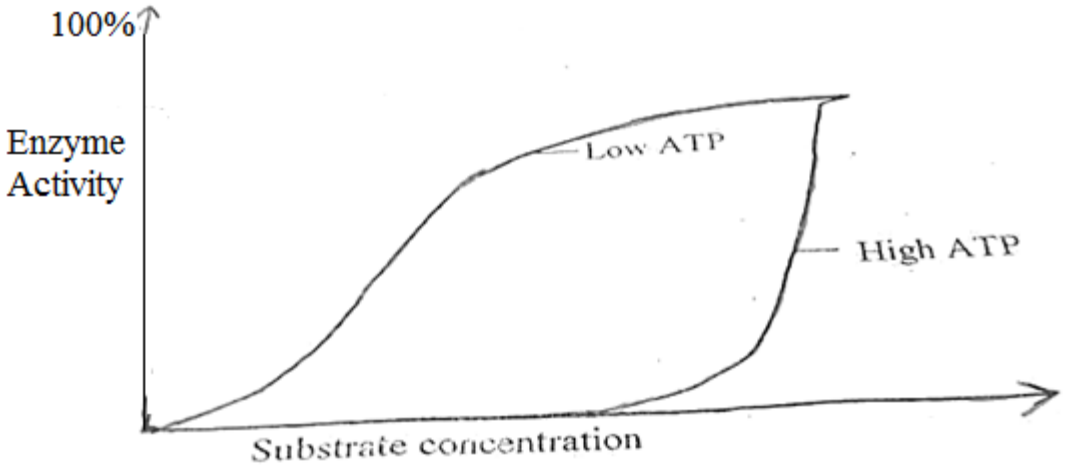
46. (a)(i) **Explain why less glucose is required to maintain cell metabolism in aerobic than anaerobic conditions.** (3 marks)

- Glucose is completely oxidized to carbon dioxide and water yielding 38 ATP per molecules, (Accept 2880KJ).
- In anaerobic respiration glucose is broken down into intermediate compounds, e.g. LACTI ACID in animals, ethanol at CO_2 in fungi and pants, yielding (2ATP, Accept 150KJ).
- Several glucose molecules in anaerobic respiration will be required to produce energy equivalent to that of aerobic respiration of one glucose molecules.

(ii) **What is the role of oxygen in oxidative phosphorylation?** (2 marks)

- Oxygen is used in the oxidation of hydrogen, to form water and 3ATP.

(b) The graph show the activity of an enzyme that controls glycolysis at increasing substance concentration at two levels of ATP



(i) **Describe how high levels of ATP affect enzyme activity** (2 marks)

- High levels of ATP inhabit this enzyme**;** but this inhabitation is removed once the substrate concentration is very high.

(ii) **Explain how glycolysis is regulated by this enzyme** (3 marks)

- A high concentration of ADP and inorganic phosphate**;** activates a phosphorylase enzyme**;** to change glucose to glucose phosphate /to phosphorylate the hexose sugar**;** and when phosphorylated sugar releases ATP**;** phosphorylation is inhibited**;**

END