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P530/1

BIOLOGY

PAPER 1

June/July 2022

2½ hours

MWALIMU EXAMINATIONS BUREAU

UACE RESOURCE MOCK EXAMINATIONS 2022

BIOLOGY

PAPER 1

2 Hours 30 Minutes

INSTRUCTIONS

*Answer **all** the in Section **A** and Section **B**.*

Answers to Section B must be in written in the spaces provided.

Additional pages must not be inserted.

SECTION A

1. If an animal is repeatedly given a stimulus of the same intensity but it gradually fails to respond to it, the resulting behavior is called
   A. stereotyped
   B. conditioning
   C. imprinting
   D. habituation
2. Which of the following is correct about the cyanobacteria? They are
   A. prokaryotes
   B. eukaryotes
   C. acellular
   D. multicellular

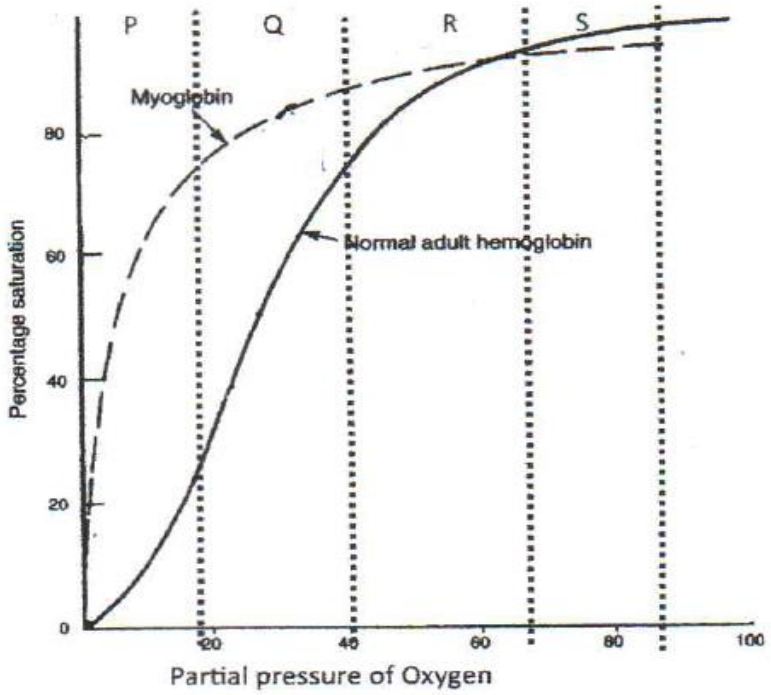
3. The development of resistance to various types of pesticides is explained partly by the random incidence of mutation and
   A. Natural selection
   B. Hybrid vigor
   C. Artificial selection
   D. polymorphism
4. which of the following describes the conditions in a photosynthesizing cell exposed to high light intensity and low carbon dioxide concentration?

	RuBP	**ATP**	**GP**
A.	high	high	low
B.	high	low	low
C.	low	high	high
D.	low	low	high

5. which one of the following transfusions would result in agglutination?
   A. Donor group A and recipient of blood group A
   B. Donor group A and recipient of blood group AB
   C. Donor group A and recipient of blood group O
   D. Donor group O and recipient of blood group A
6. Which of the following changes occurs when a myofibril relaxes?
   A. A band shortens
   B. Myosin filaments contract
   C. Sarcomere shortens
   D. I band widens
7. Which one of the following forms of bacteria has an organic source of energy and carbon?
   A. photoautotrophic
   B. chemoautotrophic

C. photo heterotrophic
D. chemo heterotrophic

8. Figure 1 shows the change in percentage saturation of myoglobin with oxygen. Over which range of partial pressures will both myoglobin and haemoglobin release oxygen to respiring tissues at greatest rate?



A. P
B. Q
C. R
D. S

9. Lichens and mutualistic organisms consisting of organisms belong to
A. One kingdom
B. Two kingdoms
C. Three kingdoms
D. Four kingdoms

10. Microscopic examination of an animal cell revealed high density of ribosomes. The cell is most likely to be a
A. Muscle cell
B. Nerve cell
C. lymphocyte
D. Bacterial cell

11. In plants, fruit ripening begins in response to increases in levels of
A. auxins

B. gibberellins
C. ethene
D. cytokinin

12. Which of the following is a physiological adaptation of a halophyte?
A. Well developed taproot system
B. Low water potential in root hairs sap
C. Possession of large air spaces
D. Low rate of transpiration

13. The availability of mineral salts in soil is most likely to be limited by
A. Intensive use of fertilizers
B. Deposition of acid rain
C. Increased afforestation
D. Reduced rate of erosion

14. Woody plants do not need a circulatory system for transporting gasses because
A. They have fewer living cells compared to animals of similar biomass
B. They have larger surface area
C. They are metabolically more active
D. Gasses would block their xylem vessels

15. Which of the following events occurs in the loop of Henle during urine formation?
A. Active release of sodium ions from descending limb
B. Active release of sodium ions from ascending limb
C. Passive release of sodium ions from descending limb
D. Passive release of sodium ions from ascending limb

16. In tomatoes the allele for red fruit (R) is dominant to that for yellow fruit (Y) and the allele for tallness (T) is dormant to that for shortness (S). In the cross RrTT XrrTt what are the chances that an offspring being homozygous for both traits?
A. 6/16
B. 9/16
C. 1/4
D. 1/2

17. Which one of tissues are responsible for secondary growth I plants?
A. Phloem and xylem
B. Cortex and pith
C. Epidermis and periderm
D. Cork cambium and vascular cambium

18. One feature that necessitated fungi to be classified in a separate kingdom from plants was
A. Having asexual reproduction as well as sexual reproduction
B. Storage of carbohydrate in form of starch
C. Parasitic nutrition as one of the many forms of nutrition
D. Undergoing nuclear mitosis instead of normal mitosis

19. The source of nutrients for the zygote before implantation is
    A. Egg York
    B. Follicle cells
    C. Ovary
    D. Uterine secretions
20. When planning a conservation strategy, the species whose survival is of greatest concern are those that are
    A. endangered
    B. rare
    C. vulnerable
    D. extinct
21. Potassium cyanide interferes with the synthesis of adenosine triphosphate in cell metabolism. If the use of potassium cyanide accelerates entry of a solute into a cell this is means it enters by
    A. Active transport.
    B. osmosis
    C. Simple diffusion.
    D. D. pinocytosis.

22. Transduction in bacteria is a form of
    A. Nutrition.
    B. asexual reproduction.
    C. Respiration.
    D. sexual reproduction.
23. Which one of the following may result in reduced supply of oxygen to the fetal tissues in mammals?
    A. Rupturing of the ling capillaries
    B. Partial closure of the foramen ovule.
    C. Accumulation of surfactant in the lungs.
    D. Partial closure of the ductus arteriosus
24. Which of the following types of mutation can increase the chromosome number of a cell?
    A. Non disjunction.
    B. Inversion.
    C. Deletion.
    D. Translocation.
25. Which one of the following forms of reproduction may result into a slow rate of increase in a population?
    A. Fragmentation.
    B. Multiple fission.
    C. Conjugation.

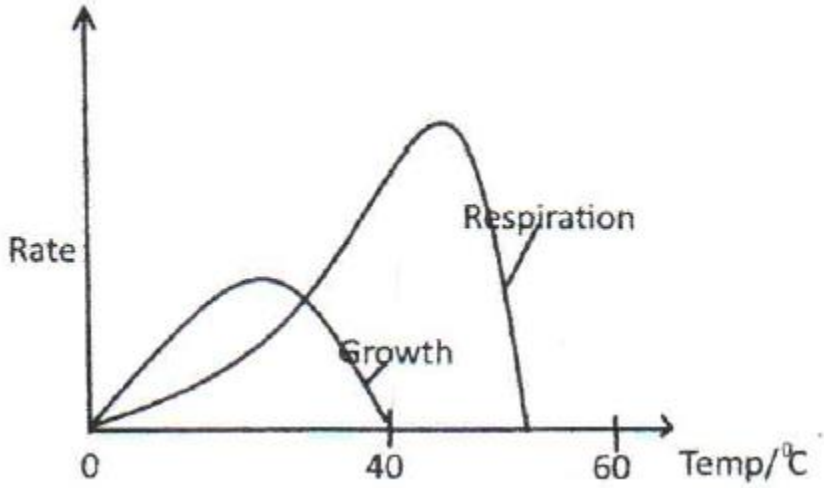
D. Sporulation.

26. Which of the following has the greatest trophic efficiency?
    A. Algae.
    B. Herbivores.
    C. Carnivores.
    D. Scavengers.

27. Which of the following substances is least required during blood clotting?
    A. Phylloquinone.
    B. Calcium ions.
    C. Phospholipids.
    D. Fibrinogen.

28. The following characteristics are exhibited by cones only except
    A. High visual acuity.
    B. Colour vision
    C. Passion of lodopsin
    D. Retinal convergence

29. Figure 2 shows the relationship between growth and respiration



Which of the following is the best conclusion from the figure
    A. At low temperature growth proceeds further than respiration
    B. Growth and respiration are inhibited by temperature
    C. Growth and respiration are affected equally by temperature.
    D. Temperature that inhibit growth still favors respiration

30. Which of the following pairs of hormones raises blood glucose levels?
    A. Growth hormones and cortisol.
    B. Adrenaline and thyroxine
    C. Thyroxine and adrenaline
    D. Growth hormones and adrenaline

31. Regular exercise increases the toughness of ligaments and tendons because
    A. Their fiber content increases in number and thickness
    B. The amount of connective tissue increases
    C. More calcium and phosphate salts are deposited in them
    D. Their myosin and actin component increases
32. If a radioactively labeled amino acid were taken up by a secretory cell, what is the correct sequence of structures in which radioactivity would appear?
    A. Cytoplasm, endoplasmic, Golgi apparatus
    B. Endoplasmic, reticulum nucleus, lysosome
    C. Lysosome, nucleus, Golgi apparatus
    D. Mitochondria, endoplasmic reticulum, lysosome
33. Carnivorous plants like Venus fly trap are commonly found in soils deficient of
    A. phosphate
    B. nitrogen
    C. potassium
    D. magnesium
34. Which of the following is an adaptation of Osteichthyes that live in water of a lower osmotic potential than that of their tissue fluids?
    A. Possession of few glomeruli
    B. Long lop of Henle
    C. Active secretion of salts into water
    D. Possession of many glomeruli
35. Molting hormone is secreted in insects undergoing metamorphosis by which glands?
    A. Corpora allata
    B. Pineal gland
    C. hypothalamus
    D. prothoracic glans
36. Auxins promote a plant to grow towards a light source by
    A. Increasing the rate of cell division on the shaded side of them
    B. Shortening the cells on the light side of the stem
    C. Causing cells on the shaded side of the stem to elongate
    D. Decreasing the rate of cell division on the light side of the stem
37. What could be the consequence of removing the casparian strip from a root endodermis?
    A. Water and minerals nutrients would not be able to reach the xylem.
    B. There would be less selectivity as to what passed into the xylem.
    C. Water and minerals salts would be lost from the xylem back into the soil.
    D. Water and mineral nutrients would no longer be able to pass through the walls of the endodermis
38. In vascular plants one difference between roots and shoots systems is that
    A. Root systems cannot undergo secondary growth
    B. Root systems undergo secondary growth but do not form bark
    C. Root systems contain pronounced zones of elongation whereas shoot systems do not

D. Root systems can store food reserves whereas stem structures do not

39. In annelids which of the following structures is used for the process of locomotion
    A. Clitellum
    B. Chaetae
    C. Septa.
    D. Parapodia

40. Prezygotic premating mechanisms include the following except
    A. Hybrid sterility
    B. Courtship rituals
    C. Habitual separation
    D. Seasonal reproduction

SECTION B (60 MARKS)

41. (a) Describe three characteristics of the specific immune response. (03 marks)

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(b)(i) what is meant by **inflammation?** (01 mark)

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(b)(ii) Outline the stages of an inflammatory response. (04 marks)

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(c) State two differences between the non-specific and specific immune systems. (03 marks)

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42. (a) What is meant by the term **gaseous exchange?** (02 marks)

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(b) Explain the following facts related to gaseous exchange in mammals. (08 marks)

(i) Inspired air is different from expired air composition

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(ii) Blood flowing into and out of the alveoli has different partial pressure of oxygen and carbon dioxide

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(iii) The composition of alveolar air remains unchanged

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(iv) Blood leaving the lungs is not fully oxygenated

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43. (a) Describe how you can use the quadrat method to determine plants population density (04 marks)

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(b) State **one** advantage and **one** disadvantage of using the quadrat method to estimate plant population density (02 marks)

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(c)(i) During the estimation of fish population in a small lake 625 fish were netted but during the marking 50 escaped. The rest were released back to the lake. After one week 873 fish were netted and out of these 50 had been marked. Determine the estimated population size of fish in this lake (03 marks)

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(ii) What assumption did you consider when working out the estimated population of fish on the pond (01 mark)

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44. (a) Explain why urea concentration in the urine rises after consumption of a meal that is rich in protein (04 marks)

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(b) Suggest why deamination in the liver could be associated with the accumulation of glycogen (03 marks)

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(c) Explain why urea is not found in the body of a fresh water fish (04 marks)

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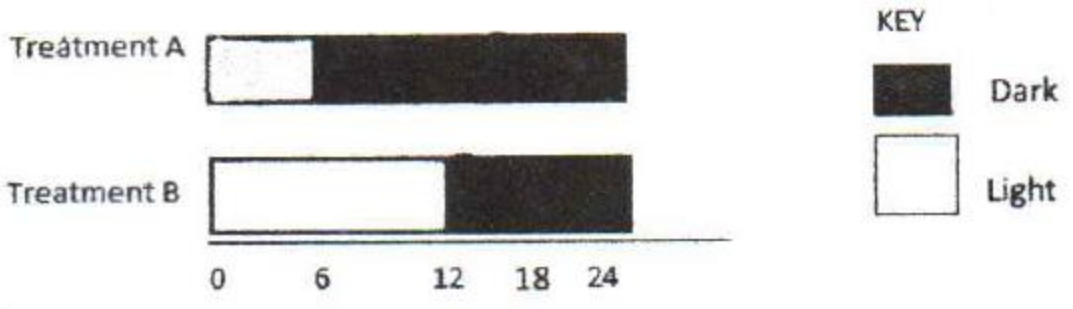
45. (a) Two groups of short-day plants were each subjected to different treatment of light and dark periods as shown in figure 3



(b) Explain how each of the treatment would affect flowering response in the two groups of plants.

(i) Treatment A

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(ii) Treatment B

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(c) In a second series of experiments the group in (a) which had been exposed to long dark periods was flashed with red and far red light in the middle of the dark periods. Giving a reason suggest the flowering response expected in plants flashed with

(i) Red light (03marks)

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(ii) Far red light (02 marks)

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(d) What conclusion can you draw from the results of experiment in (a)? (01 mark)

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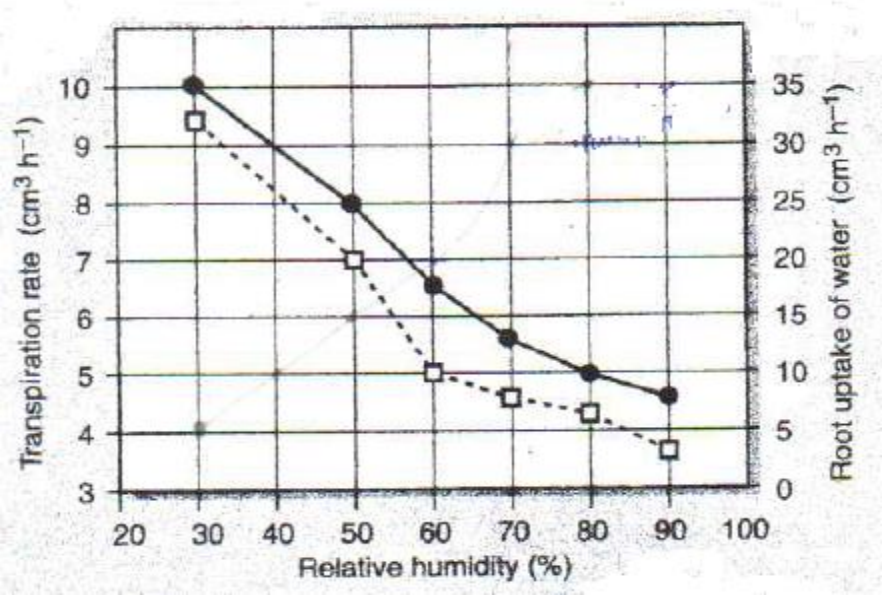
46. Figure 4 shows the transpiration and root uptake rates in peas at different relative humidity



(a) Describe the effect of increasing relative humidity on rate of transpiration and root uptake. (03 marks)

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(b) State the relationship between transpiration and root uptake with humidity (01 mark)

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(c) Explain how increasing Relative humidity affects

(i) Rate transpiration (03 marks)

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(ii) Root uptake rate (03 marks)

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(d) On the graph draw the rate of transpiration if wind speed was increased (01 mark)

(e) Explain why the graph would take up new shape drawn (03 marks)

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END