Name: ……..... Index No ……

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P530/1
Biology
(Theory)
Paper 1
MAY-JUNE-2023
June/July 2017
2 ½Hours

ACEITEKA JOINT MOCK EXAMINATIONS 2023

Uganda Advanced Certificate of Education

BIOLOGY (THEORY)

Paper 1

TIME: 2 hours 30 minutes

Instructions:
Answer all questions in both sections **A** and **B**

Answers to Section **A** should be written in the boxes provided and those to Section **B** in the spaces provided.

SECTION A (40 MARKS):

1. Provision of the baby with colostrum is one way of providing it with immunity known as
   A: Natural passive B: Acquired passive
   C: Natural active D: Acquired active

2. Which one of the following is released during ovulation?
   A: Oogonium B: ovum
   C: primary oocyte D: secondary oocyte

3. Which one of the following is not true about human chorionic gonadotrophin hormone?
   A: it stimulates corpus luteum to secrete more progesterone
   B: it prevents autolysis of corpus luteum
   C: it is secredted by the blastocyst and placenta
   D: it is secreted by the placenta only

4. Spermiogenesis refers to:
   A: Growth of the primary spermatocytes
   B: storage of spermatozoa in the epididymis
   C: Embedding of the spermatocytes in the sertoli cells
   D: differentiation of the spermatids into spermatozoa.

5. Which one of the following is not true about mitosis in plants?
   A: There is formation of asters
   B: No centrioles are involved
   C: cell plates are formed
   D: does not involve furrowing of the cytoplasm

6. Cells of organisms with genetic stability are more likely to experience the following, except;
   A: being genetically identical
   B: their chromosomes are obtained from replication of the parent chromosomes
   C: they can hardly undergo evolutionary changes
   D: Their gene pool can easily change.

7. The type of bird finches with long, slightly curved beak, with a split tongue, which existed in lowland of Archipelago, used to feed on;
   A: seeds B: fruits C: Nectar D: buds.

8. Which one of the following is not true about the solute concentration of the renal fluids?
   A: increases down the descending limb
   B: decreases up the ascending limb
   C: decreases down the collecting duct
   D: is greatest at the hairpin of the loop

9. Which one of the following does not enable the frog to live on land?
   A: storage of water in its bladder
   B: having a less permeable skin to water
   C: Active secretion of urea into the tubule of the kidney
   D: formation of glomerular filtrate at a high rate

10. Which one of the following cannot occur during hibernation of the frog?
    A: Glycogenesis B: Gluconeogenesis
    C: Glucogenesis D: Glycogenolysis.

11. Which one of the following is not true about overuse of DDT?
    A: it reduces species diversity
    B: it reduces productivity at lower levels of the ecosystem
    C: it increases productivity at higher levels of the ecosystem.
    D: it can accumulate in organisms along the food chain

12. The cellwall of Nitrosomonas is made up of;
    A: Capsule B: Peptidoglycan C: cellulose D: lignin.

13. Which one of the following is true about the mature metaxylem vessels?
    A: they are capable of stretching and growing
    B: they are living cells
    C: they are fully lignified and rigid
    D: they are formed before elongation is complete.

14. Which one of the following cells is known for causing allergic reactions in the body of an organism?
    A: Basophils B: Monocytes C: Eosinophils D: lymphocytes

15. Which one of the following plastids is important in petals of insect-pollinated flowers?
    A: Amyloplasts B: Chromoplasts C: oleoplasts D: Proteoplasts.

16. Lethal dose 50 (LD_{50}) refers to;
    A: the single dose when administered to the pests, orally, can kill half of the experimental population
    B: The dose when administered to the pests, can clear 50 members of the population
    C: the dose when administered to the pests, can accumulate in 50% of the targeted organisms
    D: this is a highly toxic dose of the pesticides, that it can kill 50% of the targeted and 50% of non targeted organisms.

17. The type of behaviour whereby an organism learns to relate its own behaviour with a reward or punishment, is known as;
    A: Latent B: Associative C: classical D: operant

18. In order for the anterior end of the earthworm to become longer, thinner and move forward, the following should occur;
    A: its circular muscles contract and protractor muscles of its setae contract also.
    B: its longitudinal muscles contract and retractor muscles of its setae relax.
    C: its circular muscles contract with the contraction of the retractor muscles of its setae
    D: Its longitudinal muscles contract, with the contraction of the protractor muscles of its setae.

19. Which one of the following is not true about spores?
    A: some spores are used for sexual reproduction
    B: all spores are asexual reproductive units
    C: some spores may serve as perennating bodies but not for reproduction
    D: most spores have small food stores.

20. Which one of the following aminoacids, commonly begins the chains of most proteins?
    A: methnonine B: Glycine
    C: Glutamine D: Glutamic acid

21. Which one of the following has a general formular CnH_2nO_2?
    A: stearic acid B: oleic acid
    C: Linolenic acid D: linoleic acid.

22. Which one of the following conversions of the Kreb's cycle leads to direct formation of ATP without electron carrier system?
    A: Pyruvic acid to AcetylcoA B: oxoglutaric acid to succinylcoA
    C: succinylcoA to succinic acid D: succinic acid to fumaric acid

23. During the down-stroke using indirect muscles, the following happens except;
    A: the longitudinal muscles contract
    B: The thoracic walls are compressed lengthwise
    C: the thoracic pressure increases
    D: the tergum is pulled downwards.

24. Which one of the following primarily controls courtship behaviour?
    A: Motivational stimulus
    B: Motivational releasing stimuli
    C: courtship signals and pheromones
    D: the urge to mate, determined by the environment

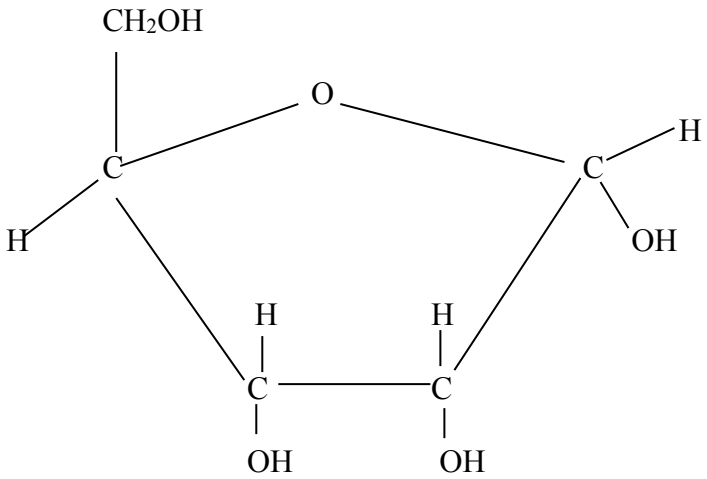
25. Which one of the following agranulocytes make the largest number in the body?
    A: Neutrophils B: Monocytes C: Lymphocytes D: Basophils.

26. Which of the following is not a component of bile?
    A: Biliverdin B: sodium taurocholate
    C: Cholesterols D: sodium chloride

27. People who are heterozygous for sickle cell anaemia, are said to have a sickle cell trait because;
    A: They have mild anaemia
    B: they are carriers
    C: there is codominance between the gene for normal haemoglobin and that for abnormal haemoglobin.
    D: The gene for normal haemoglobin shows partial dominance to that of abnormal haemoglobin

28. Which one of the following organisms has a pentadactyl limb with;
    (i) 1st digit lost
    (ii) 2nd and 5th digits reduced,
    (iii) 3rd and 4th digits longer and stouter?
    A: Horse B: Mole C: Pig D: Anteater

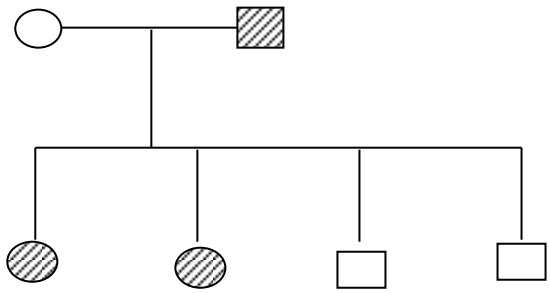
29. The diagram below shows a structural formula of a particular chemical of life



Which one of the following is represented by the formula above?
A: Pentose B: Ribose C: Ribulose D: Deoxyribose

30. Which one of these combinations of phyla contains the most advanced organisms?
    A: Tracheophyta and Echinodermata B: Tracheophyta and Chordata
    C: Chordata and Cnadaria D: Tracheophyta and Annelida

31. The pedigree in fig 2. Shows the inheritance of deafness in a family. Circles represent females, squares represent males and shaded symbols show presence of deafness.



This shows that deafness is due to a gene that is;
A: lethal and recessive B: Recessive autosomal
C: sexlinked dominant D: sex linked recessive.

32. "The earth has always existed" Which theory of life origin bases its argument on that statement above?
    A: steady state theory B: special creation
    C: spontenous generation D: Cosmozoan theory

33. Which one of the following may not lead to natural selection?
    A: A stable environment
    B: incidence of a lethal disease
    C: Prevalence of predators
    D: competition for resources.

34. During human embryo development the mesoderm gives rise to the following except;
    A: Tendons B: liver C: Vertebra D: Dermis

35. A surfactant is meant to do the following **except**:
    A: killing microbes
    B: increasing the rate of oxygen diffusion
    C: reduction of energy used to inflate the lungs
    D: prevention of friction of the lungs

36. Which of the following pairs of leucocyte phagocytes are the most active?
    A: Neutrophils and Eosinophils
    B: Neutrophils and macrophages
    C: Lymphocytes and Macrophages
    D: Lymphocytes and Neutrophils

37. Which of the following processes occurs in the cytoplasm of the mesophyll cells?
    A: Fixation of carbondioxide by RUBP
    B: Fixation of carbondioxide by PEPA
    C: Decarboxylation of malate
    D: Formation of phosphoglycerate.

38. When would the hormone oxytocin be administered to a patient?
    A: If the blood sugar rises
    B: if recovery from stress is needed.
    C: When there is need for more ejection of breast milk
    D: when there is need for more production of breast milk.

39. The heart sounds are due to;
    A: blood flowing
    B: the closure of valves
    C: the heart muscle contracting
    D: the opening of the valves.

40. If oxygen is unavailable the electron transport system cannot work mainly because
    A: there will be no ATP for electron transport
    B: Reduced NAD and FAD cannot be oxidised
    C: Hydrogen cannot be split to release electrons
    D: Oxidised NAD and FAD cannot be reduced.

Section B: (60 marks)

Answer all questions in the spaces provided.

41. (a) Draw and label a transverse section of an anther head

(b) Outline the role played by any two labelled parts of the diagram

(i) ……

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(ii) ……

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(c) Briefly explain how a young embryo sac develops into a mature ovule.

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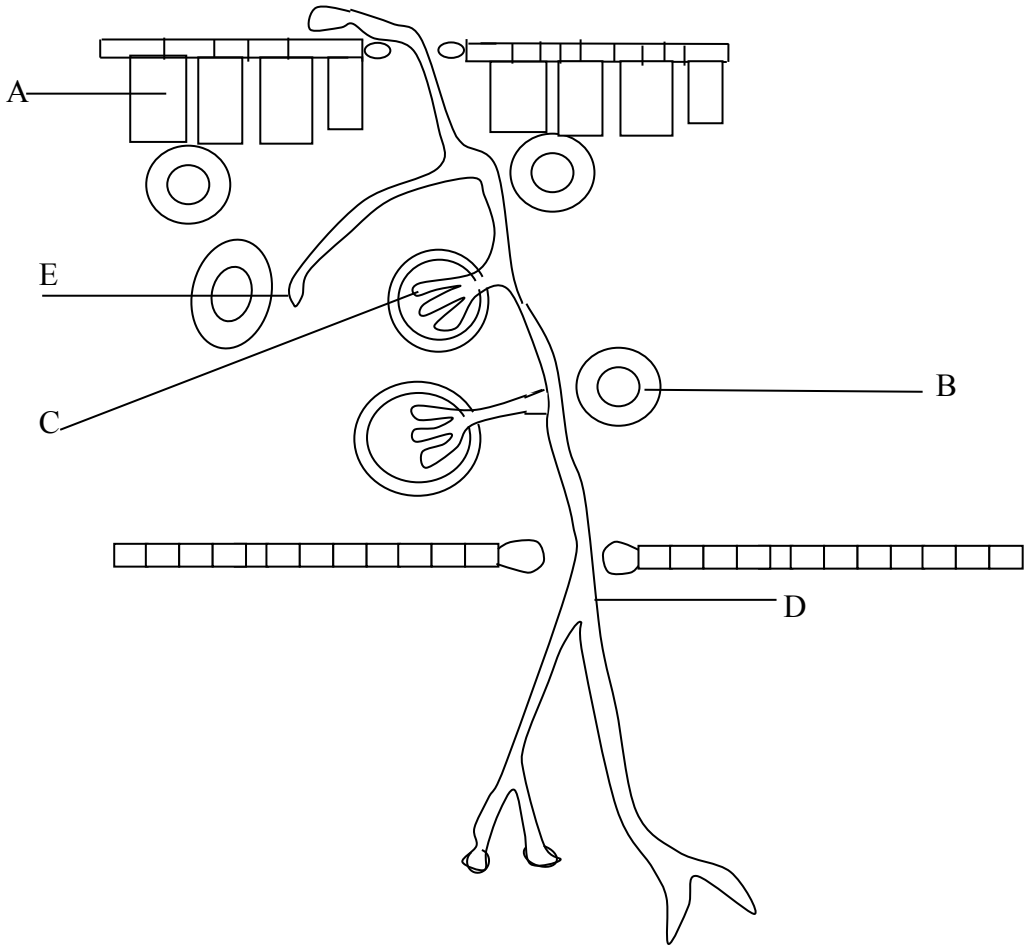
42. The diagram below shows an interaction between a plant leaf and a parasitic fungus. Study the diagram and answer the questions that follow.



(a) Name the labelled parts

A ……

B……

C……

D……

E……

(b) Give the name of the fungus

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(c) Name the disease caused by the fungus.

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(d) Outline the adaptations of the fungus for its survival

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(e) Mention any two effects of Wuchereria bancrofti to its host.

(i) ……

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(ii) ……

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43. (a) Define the term Bohr effect

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(b) Briefly explain the following observations;

(i) The plasma membrane of erythrocytes is impermeable to positively charged ions.

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(ii) Sickle-shaped erythrocytes are less efficient in carrying oxygen to the tissues than the normal shaped cells.

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(c) The alveolar capillary lumen is smaller than the size of erythrocytes which pass through it

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(d) Mention any two blood pigments which contain iron apart from haemoglobin and myoglobin

(i) ……

(ii) ……

44. (a) Define the term euploidy

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(b) Briefly explain why mutated genes cannot be eliminated from the populations of organisms.

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(c) Briefly explain the role of mutation towards evolution

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(d) Mention any two mutagens

(i) ……

(ii) ……

45. (a) Define the term euryhaline fish

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(b) What is the physiological advantage of the euryhaline fish gills over the rest of the fish?

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(c) Briefly explain what happens to an eel when it temporarily colonise the seawater.

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(d) What is the ecological significance of euryhaline behaviour?

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46. (a) Mention any two reasons why Mendel chose to use *Pisum sativum*, in his experiments.

(i) ……

(ii) ……

(b) Manx cats do not have tails. When a manx cat is mated with a normal long tailed cat, approximately half of the offsprings are long tailed and approximately half are manx. When two Manx are mated, the ratio of offsprings is 2 Manx to 1 log tailed cat.

(i) What does this suggest about the inhentance of the Manx condition in cats

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(ii) Show by means of a cross, the inheritance of the Manx condition when two Manx cats are mated.

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END