NAME: …… STREAM: ……

SIGNATURE: …….. COMBINATION: ……

P530/1
BIOLOGY PAPER 1
(THEORY)
TIME: HOURS

Uganda Advanced Certificate of Education
S.5 BIOLOGY PAPER ONE
(THEORY)
2HOURS 30 MINUTES

Instructions

- Attempt all questions in section A and B.
- Answers to section A must be filled in boxes on the right-hand side.
- Answers to section B must be written in the spaces of the question paper provided.

SECTION A (40 MARKS)

1. What of the following would you expect to increase at successive levels of a food chain
   A. Total numbers of consumers.
   B. Total energy content.
   C. Concentration of pollutants in organism.
   D. Biomass of organisms.
2. An association between fungus and an alga in lichens is an example of;
   A. Mutualism
   B. Commensalism
   C. Parasitism
   D. Ammensalism
3. The competitive exclusive principle attempts to explain why
   A. A particular niche contains one species only.
   B. Pioneer plants are found in climax community.
   C. There are rarely more than five trophic levels in an ecosystem.
   D. The biotic diversity of a habitat increases with succession
4. Essential amino acids are those which;
   A. Are oxidisable to produce energy.
   B. Are produced by dietary proteins.
   C. The body can synthesize on its own.
   D. Are essential for growth of tissues.
5. Which of the following is the most important factor causing extinction of fish species to day?
   A. Predation
   B. Mutualism
   C. Competition
   D. Habitat alternation
6. Which of the following is a Lepidoptera?
   A. Butterfly
   B. Honey bee
   C. During beetle
   D. Cockroach

7. Cytoplasmic strands that join cells to one another are referred to as
   A. Muscular fibres
   B. Cilia
   C. Basal bodies
   D. Plasmodesmata
8. The arrangement below represents the correct arrangement of microtubules in a cross section of Euglena's flagellum. Which one is it?
   A. 9+1
   B. 9+2
   C. 9+4
   D. 9+0
9. The matrix in cartilage is secreted by
   A. Chondrocytes
   B. Osteoblasts
   C. Chondroblasts
   D. Osteoclasts
10. In which one of the following is ciliated epithelium found?
    A. Kidney tubules
    B. Small intestines
    C. Lining of capillaries
    D. Lining of alveoli
11. Which one of the following glands is compound saccular?
    A. Mammary glands
    B. Sebaceous glands
    C. Sweat glands
    D. Gastric glands
12. Which one of the following cell organelles is associated with the final stage of most cell secretions?
    A. Smooth endoplasmic reticulum
    B. Rough endoplasmic reticulum
    C. Ribosome
    D. Golgi body
13. The following tissues are ideal except?
    A. Fibres
    B. Tracheids
    C. Sieve tubes
    D. Schlereids
14. Which one of the following organelles would be most active at sides where substances move against a concentration gradient?
    A. Endoplasmic reticulum
    B. Mitochondria
    C. Lysosomes
    D. Golgi bodies
15. Which one of the following structures plays an important role in the formation of primary cell walls?
    A. Golgi body
    B. Lysosome
    C. Rough endoplasmic reticulum
    D. Ribosome

16. Simple tubular glands are most likely to be found in;
    A. Skin of frog
    B. Crypt of Lieberkühn
    C. Duodenum
    D. Ileum
17. The cause of eutrophication of water bodies is;
    A. Thermal pollution
    B. Radioactive pollutants
    C. Biodegradable pollutants
    D. Non-biodegradable pollutants
18. The bacteria that converts ammonia into nitrite in the soil are
    A. Nitrobacter
    B. Nitrosomonas
    C. Azotobacter
    D. Rhizobium
19. The bond joining two glucose units in a disaccharide is called
    A. Glycosidic bond.
    B. Dipeptide bond
    C. Edysosidic bond
    D. Ester bond
20. Which of the following structures does not replicate?
    A. Chromosomes
    B. Centrioles
    C. Ribosomes
    D. Centromeres
21. Which one of the following molecules is important in cell signaling and recognition?
    A. Glycoproteins
    B. Phospholipids
    C. Cholesterol
    D. Glycolipids
22. When does association of homologous chromosomes occur during meiosis?
    A. Prophase II
    B. Prophase I
    C. Metaphase I
    D. Anaphase
23. Which one of the following is not caused by deforestation?
    A. Global atmospheric warming due to greenhouse effect.
    B. Disappearance of water catchment areas.
    C. Improve germination of positively photoblastic seeds.
    D. Decrease in plant diversity.
24. A good example of a prokaryote is
    A. Entamoeba
    B. Plasmodium
    C. Trypanasoma
    D. Blue-green alga

25. Which of the following is not a function of the cell membrane?
    A. Binding cytoplasm to stop it from oozing out of the cell.
    B. Allowing selective absorption and discharge of materials.
    C. Forming pinocytic vesicles.
    D. Manufacturing lipids and lipoproteins.
26. Which of the following events occur during telophase of mitosis in the meristematic cells of root tip
    A. Cleavage of the cytoplasm
    B. Replication of the chromosomes
    C. Replication of centrioles
    D. Formation of the cell plate
27. One important advantage of a light microscope over an electron microscope in biological studies is that;
    A. It is portable.
    B. It can be used to examine living specimen.
    C. Its source of radiation is light while that of electron microscope is electrons.
    D. It has a set of quartz or glass lenses while the electron microscope has electromagnets for its lenses.
28. Which one of the following terms refers to the site of crossing over during meiosis?
    A. Synapsis
    B. Chakinesis
    C. Centromere
    D. Chiasma
29. For diffusion to occur
    A. The diffusing particles should all be of uniform size.
    B. The diffusion medium should be of uniform density.
    C. There must be uniform distribution of the diffusing particles.
    D. A free energy gradient must exist.
30. The existence of ring worms on human skin is an example of;
    A. Parasitism
    B. B. Mutualism
    C. Commensalism
    D. Symbiosis
31. Which one of the following best describes the energy flow in an ecosystem?
    A. Is greatest through primary producers.
    B. Is similar in primary and secondary producers.
    C. Is equally distributed between primary and secondary consumers.
    D. Is independent of external factors.
32. In an experiment a potato cube was placed in a strong solution of sodium chloride. The cube became flaccid due to
    A. Dialysis
    B. Osmosis
    C. Diffusion
    D. Plasmolysis
33. Which one of the following biological process does not utilize respiratory energy?
    A. Mineral salt absorption
    B. Synthesis of cellulose
    C. Meiosis
    D. Loss of water from the stomata.

34. Which one of the following is incorrect about pinocytosis?
    A. It involves use of energy in form of ATP.
    B. It involves removal of bulky materials from the cell.
    C. It involves infolding of the cell membrane.
    D. It involves pinching of vesicles from the cell membrane.
35. Which one of the following is the significance of nitrification towards *Nitrobacter*?
    A. To obtain oxygen for their respiratory activities.
    B. To obtain organic food substances for their growth.
    C. To obtain energy for their food synthesis.
    D. To increase the level of nutrients in soil.
36. During which one of the following transfers of energy does the greatest loss of energy occur?
    A. Sun to primary producer.
    B. Primary producer to primary consumer.
    C. Primary consumer to secondary consumer.
    D. Secondary consumer to tertiary consumer.
37. How many water molecules are produced when 30 molecules of glycerol are used to synthesize triglycerides?
    A. 15
    B. 30
    C. 60
    D. 90
38. Which one of the following is not true about a rare species?
    A. Its members are nearly becoming extinct.
    B. Its members are geographically restricted.
    C. It has a small population.
    D. Its members are widely scattered.
39. Plant roots in association with symbiotic bacteria is an indication that
    A. The plant is unhealthy.
    B. The roots have been attacked.
    C. Soil around the roots lacks nitrogen.
    D. Soil around the roots lacks humus.
40. Which of the following is a function of the Golgi apparatus?
    A. Secreting substances out of the cells.
    B. Synthesis of proteins.
    C. Assembling of raw materials for secretion.
    D. Synthesizing carbohydrates.

SECTION B (60 MARKS)

41.

(a) Draw a well labeled diagram of a bivalent during zygotene of prophase I. (06 marks)

(b) Explain how the process of meiosis causes variation in sexually producing organisms. (04 marks)

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42.

(a) Define the following terms. (06 marks)

(i) Parasitism

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(ii) Mutualism

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(iii) Commensalism

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(iv) Mimicry

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(b) How is the tapeworm physiologically adapted for its mode of life. (03 marks)

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(c) What is the biological significance of mimicry? (01 mark)

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43.

(a) With examples state the functions of the following tissues in animals.

(i) Stratified epithelium (02 marks)

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(ii) Transitional epithelium (02 marks)

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(iii) Cuboidal epithelium (02 marks)

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(iv) Smooth muscles (02 marks)

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(v) Skeletal muscles (02 marks)

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44.

(a) Name the molecules that make up the cell membrane. (Include the roles played by each of the molecules named. (08 marks)

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(b) Cilia and flagella are structures associated with the cell membrane.
State how the two structures differ in function. (02 marks)

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45.

(a) What would be the effect of removing mitochondria from a cell? (02 marks)

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(b) What is the difference between a prokaryotic cell and eukaryotic cell? (04 marks)

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(c) Give evidence that shows the role of the nucleus in a cell. (04 marks)

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46.

(a) Define the following terms related to protein synthesis.

(i) Transcription. (02 marks)

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(ii) Translation. (02 marks)

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(b) Outline the features of the genetic code. (03 marks)

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(c) Describe the structure of tRNA. (05 marks)

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END

"The way to get started is to quit talking and begin doing."