TOPIC: BIODIVERSITY AND THE CONCEPTS OF CLASSIFICATION

Time: 2 ½ hours

Attempt all questions in this paper

SECTION	MARKS
A	
B	
TOTAL	

SECTION A (40 MARKS)

1. The fusion of two motile gametes which ae dissimilar in size is termed as
   A. Oogamy
   B. Isogamy
   C. Anisogamy
   D. Zoogamy
2. In which kind of organization does multicellularity occur?
   A. Aggregates
   B. Archaebacteria
   C. Eukaryotes
   D. Prokaryotes
3. Viroids differ from viruses in having
   A. DNA molecules without protein coat
   B. RNA molecules with protein coat
   C. RNA molecules without protein coat
   D. DNA molecules with protein coat
4. Through what process do cells become specialized?
   A. Aggregation
   B. Colonization
   C. Differentiation
   D. Vascularization
5. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen.
   A. *Pseudomonas*
   B. Mycoplasma
   C. *Nostoc*
   D. *Bacillus*
6. Which of the following components provide the sticky character to the bacterial cell?
   A. Nuclear membrane
   B. Plasma membrane
   C. Glycocalyx
   D. Cell wall
7. What term is used to describe an organization with cells that are permanently associated but do not communicate with one another?
   A. Aggregate
   B. Colonial
   C. Complex
   D. Heterotrophic
8. The embryo sac of an angiosperm is made up of
   A. 8 cells
   B. 7 cells and 8 nuclei
   C. 8 nuclei
   D. 7 cells and 7 nuclei
9. DNA replication in bacteria occurs
   A. Without nucleolus
   B. Prior to fission
   C. Just before transcription
   D. During S phase.
10. Which one of the following is wrong for fungi?
    A. They are eukaryotes
    B. They are heterotrophic
    C. Have a cell wall made of murein
    D. Reproduce asexually.
11. Metameric segmentation is the characteristics of
    A. Mollusca and chordata
    B. Platyhelminthes and arthropoda
    C. Echinodermata and annelida
    D. Annelida and arthropoda
12. How are the cells of multicellular fungi arranged?
    A. In sheets
    B. In tissues
    C. In colonies
    D. In filaments
13. As we go from species to kingdom in a taxonomic hierarchy, the number of common characteristics and number of organisms will
    A. Decrease and increase respectively
    B. Increase and decrease respectively
    C. Remain the same
    D. Increase or decrease
14. Which of the following "suffixes" used for units of classification indicates a taxonomic category of family?
    A. ____ales
    B. ____onae
    C. ____aceae
    D. ____ae
15. The term systematics refers to
    A. Identification and study of organ systems of plants and animals.
    B. Identification and preservation of plants and animals.
    C. Diversity of kinds of organisms and their relationship
    D. Study of habits of organisms and their classification.
16. If the diploid number of a flowering plant is 36. What would be the chromosome number in its endosperm?
    A. 36
    B. 18
    C. 54
    D. 72
17. Genus represents
    A. An individual or animal
    B. A collection of plants or animals

C. A group of closely related species of plants or animals
D. A group of organisms that can easily interbreed to give viable offsprings.

18. A prothallus is
    A. a structure in pteridophytes formed before the thallus develops.
    B. A sporophyte free-living structure formed in pteridophytes
    C. A gametophyte free-living structure formed in pteridophytes.
    D. A primitive structure formed after fertilization in pteridophytes.
19. Identify from the following., the only taxonomic category that has a real existence.
    A. Phylum
    B. Species
    C. Genus
    D. Kingdom
20. One of the most functions of botanic gardens is that
    A. One can observe tropical plants there
    B. They provide the natural habitat for wild life.
    C. They allow ex-situ conservation of germplasm
    D. They provide a beautiful area for recreation
21. In five kingdom system of classification, the main basis of classification is
    A. Structure of cell wall
    B. Nutrition
    C. Structure of nucleus
    D. Asexual reproduction
22. First life on earth is mostly to have been
    A. Cyanobacteria
    B. Chemoheterotrophs
    C. Autotrophs
    D. Photoautotrophs
23. The most important feature of all living systems is to
    A. Utilize oxygen to generate energy
    B. Replicate the genetic information
    C. Produce gametes
    D. Utilize solar energy for metabolic activities.
24. Protonema is
    A. Haploid and is found in mass
    B. Diploid and is found in liverworts
    C. Diploid and is found in pteridophytes
    D. Haploid and is found in pteridophytes
25. The most likely reason for the diversity of living beings is
    A. Mutation
    B. Gradual change
    C. Long term evolutionary change
    D. Short term evolutionary change
26. Radial symmetry and lack of cnidoblasts are the characteristics of
    A. *Hydra* and starfish
    B. Starfish and sea anemone
    C. Ctenoplana and *Beroe*
    D. *Aurelia* and *Paramecium*
27. Moss peristome takes part in
    A. Spore dispersal
    B. Photosynthesis
    C. Protection
    D. Absorption
28. Which one of the following has an open circulatory system?
    A. Octopus
    B. Pheretima
    C. *Periplaneta*
    D. Hirudinaria
29. In which one of the following sets of animals do all the four give birth to young ones?
    A. Kangaroo, Hedgehog, Dolphin and Loris
    B. Lion, bat, whale and ostrich
    C. Platypus, penguin, bat and *Hippopotamus*
    D. Shrew, bat, cat and kiwi
30. Which one of the following is a matching pair of a body feature and the animal possessing it?
    A. Ventral heart – scorpion
    B. Post anal tail – octopus
    C. Ventral central nervous system – leech
    D. Pharyngeal gill slits absent in embryo – chameleon
31. The plant group that produces spores and embryo but lacks vascular tissues and seeds is
    A. Pteridophyta
    B. Rhodophyta
    C. Bryophyta
    D. Phaeophyta
32. What is true about Nereis, scorpion, cockroach and silver fish, they all
    A. belong to the same phylum
    B. have paired jointed appendages
    C. possess dorsal heart
    D. have a cuticle
33. What is common between parrot, platypus and kangaroo
    A. Oviparity
    B. homoiothermy
    C. toothless jaws
    D. functional post anal tail
34. Bryophytes are amphibians because
    A. They require a layer of water for carrying out sexual reproduction
    B. They occur in damp places
    C. They are mostly aquatic
    D. Their spores are dispersed in wet environments
35. Which one of the following is not a characteristic of phylum annelida?
    A. Closed circulatory system
    B. Segmentation
    C. Pseudo coelom
    D. Ventral nerve cord
36. In hot and cold seasons, the number of malaria cases as well as Anopheles decline, reappearance of malaria in humid warm conditions is due to

A. Surviving malarial parasites in human carriers
B. Surviving sporozoites in surviving mosquitoes
C. Monkeys
D. Mosquito larvae in permanent waters.

37. Blood of *Pheretima* – a genus of earthworms is
A. Blue with haemocyanin in corpuscles
B. Blue with haemocyanin in plasma
C. Red with haemoglobin in corpuscles
D. Red with haemoglobin in plasma

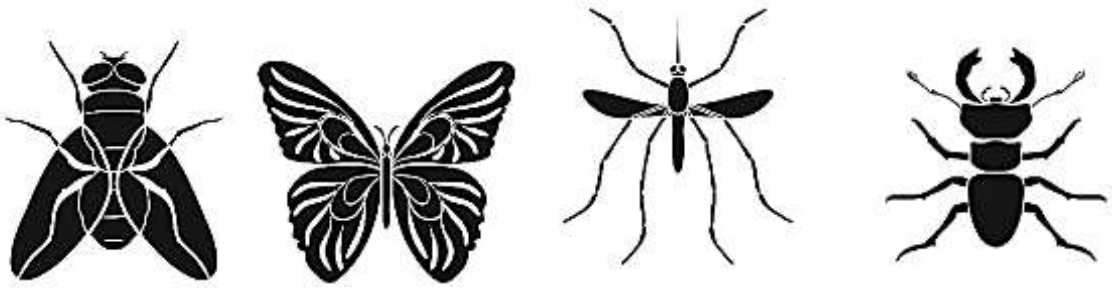
38. Earthworms possess hearts with
A. 6 pairs
B. 2 pairs
C. 5 pairs
D. 1 pair

39. The excretory structures of flat worms are
A. flame cells
B. Protonephridia
C. Malpighian tubules
D. Book lungs

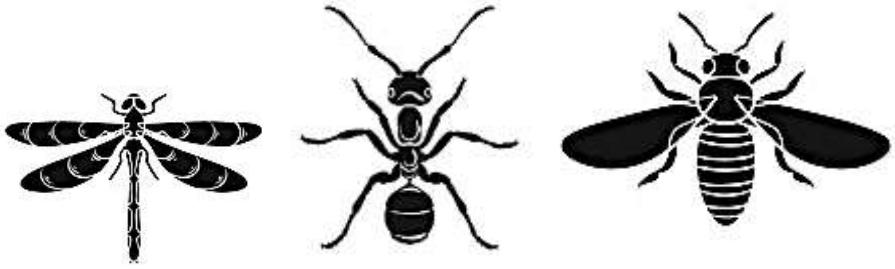
40. In pinus or gymnosperms, the haploid structures are
A. Megaspore, endosperm and embryo
B. Megaspore, pollen grains and endosperm
C. Megaspore, integument and root
D. Pollen grain, leaf and root

SECTION B. (60MARKS)

41. The figure below shows different images P to V, representing organisms in phylum arthropoda. Study the figure carefully and use it to answer the questions that follow.



P Q R S



T U V

Examine the external features of each organism, use these features to construct an identification key for identification of the organisms. (10marks)

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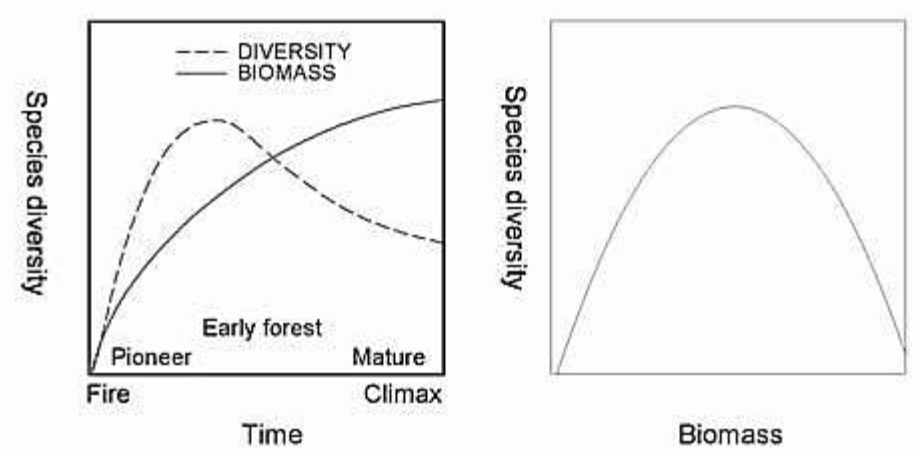
42. The temporal patterns of species diversity and biomass along successional sequences based on Whittaker's in 1970 post-fire forest succession model. The corresponding diversity – biomass relationship over time are shown in figure below. Study them carefully and answer the questions that follow.



(a) Explain the changes observed in graph A and in graph B.

Graph A (4marks)

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Graph B (2marks)

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(b) State four characteristics of climax communities. (2marks)

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(c) How has man interfered with the stable nature of the climax community. (2marks)

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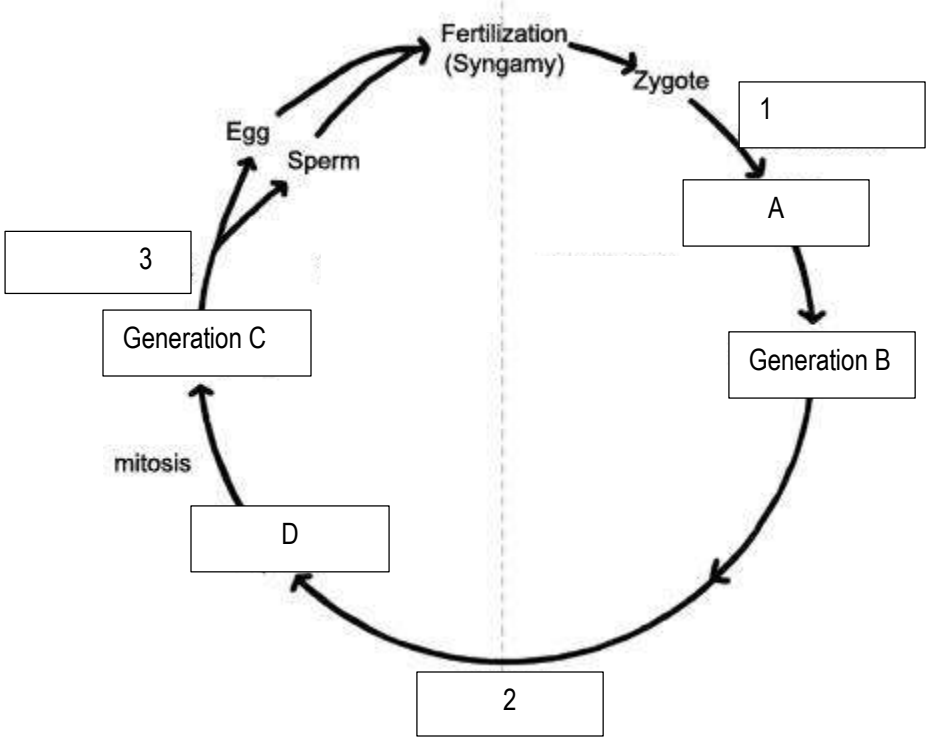
43. The figure below shows a generalized life cycle of a moss plant. Use it to answer the questions below.



(a) (i) Identify the type of cell division that occur at 1 and 2. (1mark)

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(ii) State the significance of the cell division that occurs at 3. (2marks)

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(b) (i) Explain the genetic difference of generations B and C. (2marls)

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(ii) State how structures A and D are formed. (1mark)

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(c) How is the structure in generation C adapted to its roles in the moss plant? (2marks)

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(d) Outline the significance of this type of reproduction in lower plants. (2marks)

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44. Many of the major evolutionary adjustments that occurred in the animal kingdom from invertebrates to vertebrates included the development bilateral symmetry, development of the coelom and segmented body plan, and the successive transition from water to land environments.

(a) Describe how each of the following adjustments enable the survival of vertebrates.

(i) Bilateral symmetry (1mark)

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(ii) Development of segmented body plan. (1mark)

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(b) (i) Outline the changes that occurred to animals in the transition from water to land habitats. (3marks)

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(ii) Mention the challenges that vertebrates face on land. (2marks)

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(c) How is the coelom:
(i) advantageous (2marks)

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(ii) disadvantages to the organisms possessing it. (1mark)

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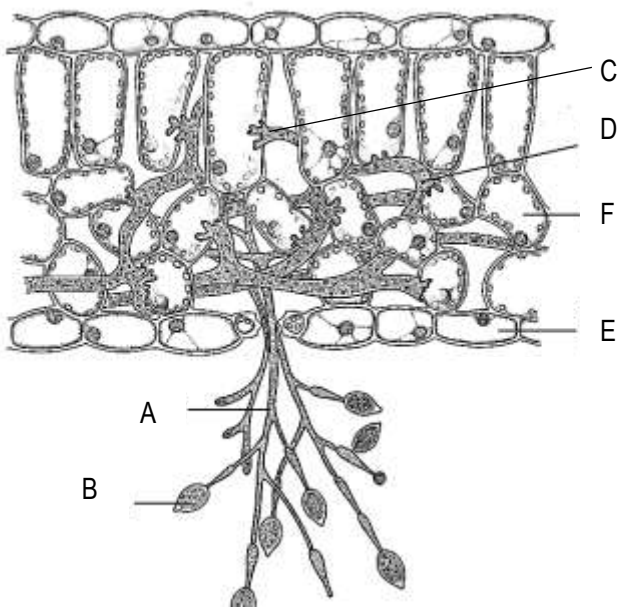
45.The figure below shows a parasitic fungus *Phytophthora infestans* established in the transverse section of a potato leaf. Use it to answer questions that answer.



(a) (i) Identify the structures labeled. (2marks)

A……

B……

F……

E……

(ii) Describe the structure and function of structure C to the parasite. (3marks)

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(b) State how the parasite is adapted to its mode of feeding. (3marks)

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(c) Suggest how the effect of this parasite can be minimized in the above plant. (2marks)

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46. Viruses are smaller particles that a special group of them called bacteriophage, are known to infect bacterial cell. Viruses are infectious particles that particularly attack specific animals and plants. Some viruses called retroviruses possess an enzyme reverse transcriptase attached to their genetic material. Use this information to answer questions that follow.

(a) Which part of the virus is infectious and how is it that viruses cannot infect all types of cells? (2marks)

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(b) Describe the two cellular pathways a virus can take to replicate its nucleic acid and make new viral particles? (4marks)

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(c) How do the new bacteriophages leave the host cell? (1mark)

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(d) Explain the role of the enzyme reverse transcriptase to retroviruses. (3marks)

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