



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
DEPARTMENT	ENVIRONMENTAL SCIENCES		
MODULE	DIVERSITY OF LIFE		
MODULE CODE	BLG3512		
DATE	JANUARY 2023		
DURATION	3 Hours	MARKS	100

SUMMER TERM EXAM

**Examiners: Mrs. Lang, Mr. Eiman, Ms. Deelie, Dr. Horn, Mr. Mukuve
Dr. Amoo, Ms. Kasinda, Dr. Hay**

Moderator: Dr. Hart

This question paper consists of 6 pages including this front page

Instructions

1. Carefully read all the instructions.
2. There are three sections in this paper.
3. Answer all questions in Sections A and B. Answer only ONE question in Section C.
4. Label all the answers to the sections clearly.

UNIVERSITY OF NAMIBIA EXAMINATIONS

Section A: Multiple choice / true or false section

This section is worth 30 marks, 1 mark per question. Answer all the questions

1. Which statement about the genomes of prokaryotes is *correct*?
 - A) Prokaryotic genomes are diploid throughout most of the cell cycle
 - B) Prokaryotic chromosomes are sometimes called plasmids
 - C) Prokaryotic cells have multiple chromosomes "packed" with a relatively large amount of protein
 - D) The prokaryotic chromosome is not contained within a nucleus but, rather, is found at the nucleoid region

2. This structure (present in some bacteria), enables those that possess it to germinate after exposure to harsh conditions, such as boiling.
 - A) endospore
 - B) sex pilus
 - C) flagellum
 - D) cell wall

3. Regarding prokaryotic reproduction, which statement is *correct*?
 - A) Prokaryotes form gametes by meiosis
 - B) Prokaryotes feature the union of haploid gametes, as do eukaryotes.
 - C) Prokaryotes exchange some of their genes by conjugation, the union of haploid gametes, and transduction
 - D) Mutation is a primary source of variation in prokaryote populations

4. Which of the following obtain energy by oxidizing inorganic substances; energy that is used, in part, to fix CO₂?
 - A) photoautotrophs
 - B) photoheterotrophs
 - C) chemoautotrophs
 - D) chemoheterotrophs that perform decomposition

5. Most fungi have cell walls made of
 - A) flagellates
 - B) organelles
 - C) chitin
 - D) protists

6. Archaeplastida consists of.....
 - A) green algae
 - B) land plants
 - C) red algae
 - D) red algae, green algae, and land plants

7. In most fungi, the haploid nuclei from each parent do not fuse right away; they coexist in the mycelium called a
 - A) dikaryotic
 - B) heterokaryon
 - C) pheromones
 - D) zygote

8. The Streptophyta consists of
 - A) Charophytes and Chlorophytes
 - B) Charophytes and Embryophytes
 - C) Embryophytes and Chlorophytes
 - D) Embryophytes, Charophytes and Chlorophytes

9. The function of a phragmoplast is to.....
 - A) stabilize the new cell plate forming during cytokinesis
 - B) transport the daughter nuclei during cytokinesis
 - C) develop into a new cell wall
 - D) divide the two daughter cells

10. What name is given to a process whereby pollen is transferred to the part of a seed plant containing the ovules?
 - A) fertilization
 - B) heterospory
 - C) pollination
 - D) homosporous

11. While snorkeling, a student observes an active marine animal that has a series of muscular tentacles bearing suckers associated with its head. Segmentation is not observed, but a pair of large, well-developed eyes is evident. The student is observing an animal belonging to which class?
 - A) chitons
 - B) bivalves
 - C) gastropods
 - D) cephalopods

12. Organisms showing radial symmetry would likely.....
 - A) be good swimmers
 - B) have rapid escape behavior
 - C) move from place to place relatively slowly, if at all
 - D) be able to fly

13. Which of the following is descriptive of protostomes?
 - A) spiral and indeterminate cleavage, blastopore becomes mouth
 - B) spiral and determinate cleavage, blastopore becomes mouth
 - C) spiral and determinate cleavage, blastopore becomes anus
 - D) radial and determinate cleavage, blastopore becomes anus

14. What is characteristic of all ecdysozoans?
- A) the deuterostome condition
 - B) some kind of exoskeleton, or hard outer covering
 - C) a pseudocoelom
 - D) agile, speedy, and powerful locomotion
15. Bilaterian animals are.....
- A) bilaterally symmetrical and have triploblastic development
 - B) coelomates
 - C) Acoelomates
 - D) A & B
16. Lampreys differ from hagfishes in.....
- A) lacking jaws
 - B) having a cranium
 - C) having pharyngeal clefts that develop into pharyngeal slits
 - D) having a notochord that is surrounded by a tube of cartilage
17. Which of these statements accurately describes a similarity between sharks and ray-finned fishes?
- A) The skin is typically covered by flattened bony scales
 - B) They are equally able to exchange gases with the environment while stationary
 - C) They are highly maneuverable due to their flexibility
 - D) They have a lateral line that is sensitive to changes in water pressure
18. What permits reptiles to thrive in arid environments?
- A) Their bright coloration reflects the intense UV radiation
 - B) A large number of prey and a limited number of predators are available in the desert
 - C) A cartilaginous endoskeleton provides needed flexibility for locomotion on sand
 - D) Their scales contain the protein keratin, which helps prevent dehydration
19. Which era is known as the "age of reptiles"?
- A) Cenozoic
 - B) Mesozoic
 - C) Paleozoic
 - D) Precambrian
20. Differentiation of teeth is observed in.....
- A) sharks
 - B) bony fishes
 - C) amphibians
 - D) mammals

True or false: for each statement please indicate whether the statement is true or false.

21. Proteobacteria are gram positive bacteria that include only photoautotrophs.
22. Mixotrophs combine photosynthesis and heterotrophic nutrition.
23. Mycorrhizae are mutually beneficial relationships between fungi and animals.
24. Class gastropoda have terrestrial molluscs without a shells.
25. If a multicellular animal lacks true tissues, then it can probably be included among the bilateria.
26. Sea cucumbers lack spines, have a reduced endoskeleton, and do not resemble other echinoderms.
27. In myriapods, gas exchange takes place across its body surface, and protonephridia regulate the osmotic balance.
28. The function of the sporopollenin in Charophytes is to facilitate the growth of zygotes.
29. Plants supply oxygen and are the ultimate source of most food eaten by land animals.
30. The earliest fossils placed in our genus *Homo* are those of *Homo erectus*.

Total: 30

Section B: Short Question Section

This section is worth 40 marks. Answer all the questions

1. Distinguish between gram positive and gram negative and indicate which is likely to be antibiotic resistant? (3)
2. Define the terms: Phylogeny, Taxonomy & hierarchical classification? (3)
3. What is transduction? (1)
4. What is the significance of seedless vascular plants starting from the Devonian period to modern day? (7)
5. Name the FOUR key traits that appear in nearly all land plants but are absent in them Charophytes. (4)
6. What is the evolutionary importance of the emergence of seeds in the Plant kingdom? (2)
7. In table form, name and explain THREE morphological differences between monocots plants and dicot plants? (9)
8. Define the term hermaphrodite (2)
9. What is the significance of the FOXP2 gene? (1)
10. Describe the problems associated with a terrestrial existence and some of the adaptations of animals for dealing with these problems. (8)

Total: 40

Section C: Essay Questions

This section is worth 30 marks. Answer only one of the following questions. If you pick question 1 do 1.1 and 1.2 and if you pick question 2 do 2.1 and 2.2

Question 1

1.1. With the help of diagrams, tabulate the differences between protostome and deuterostome development. (15)

AND

1.2. Explain the THREE factors by which prokaryotes are able to facilitate rapid genetic diversity and adapt quickly. (15)

OR

Question 2

2.1. Discuss the characteristics of the FOUR classes of the phylum Platyhelminthes and provide an example for each. (15)

AND

2.2 Draw the general life cycle of fungi and indicate the haploid, diploid and heterokaryotic stages. (15)

Total: 30
Grand Total: 100

**** END OF EXAMINATION****