



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) – SEMESTER TWO
END OF SEMESTER EXAMINATION

Alternate

COURSE CODE : BIO117
COURSE TITLE : Organismal Biology
LECTURER(S) : Donaldene Thompson
DATE :
TIME :
DURATION : 2 hours
STUDENT ID # : _____

GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- Write your ID number on the question paper.
- **This paper consists of two (2) sections.**
- Section A – 66 multiple choice questions
- Section B – four (4) structured questions, answer ALL questions in the spaces provided.
- ANSWER ALL QUESTIONS IN EACH SECTION
- Specific instructions are given at the beginning of each section.

Question	Student's Mark	Moderated Mark
Section A 1 - 66		
Section B		
1		
2		
3		
4		
Total		

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

SECTION A

Multiple Choice Questions (1 mark each)

Instruction: Read the questions carefully and circle the correct option.

1. Which of the following traits of land plants allows them to grow in height?
 - A. alternation of generations
 - B. waxy cuticle
 - C. tracheid
 - D. sporopollenin

2. A botanist travels to an area that has experienced a long, severe drought. While examining the bryophytes in the area, he notices that many are in the same life-cycle stage. Which life-cycle stage should be the most common?
 - A. zygote
 - B. gametophyte
 - C. sporophyte
 - D. archegonium

3. What is the ploidy of the following structures: gametophyte, seed, spore, sporophyte?
 - A. 1n, 1n, 2n, 2n
 - B. 1n, 2n, 1n, 2n
 - C. 2n, 1n, 2n, 1n
 - D. 2n, 2n, 1n, 1n

4. Which of the following traits characterizes gymnosperms?
 - A. The plants carry exposed seeds on modified leaves.
 - B. Reproductive structures are located in a flower.
 - C. After fertilization, the ovary thickens and forms a fruit.
 - D. The gametophyte is the longest phase of the life cycle.

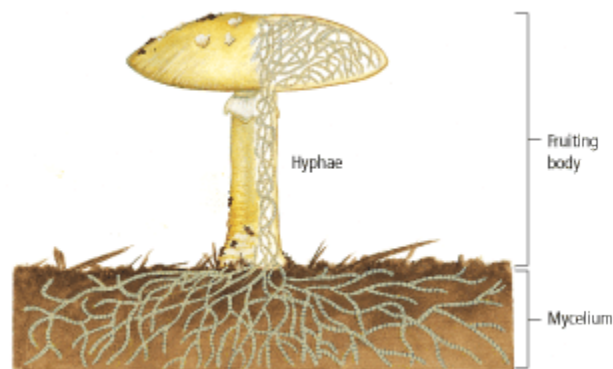
5. Which of the following is most likely to be found in a desert environment?
 - A. broad leaves to capture sunlight.
 - B. spines instead of leaves
 - C. needle-like leaves
 - D. wide, flat leaves that can float.

6. Besides the seed, what other major structure diminishes a plant's reliance on water for reproduction?
 - A. flower
 - B. fruit
 - C. pollen
 - D. spore

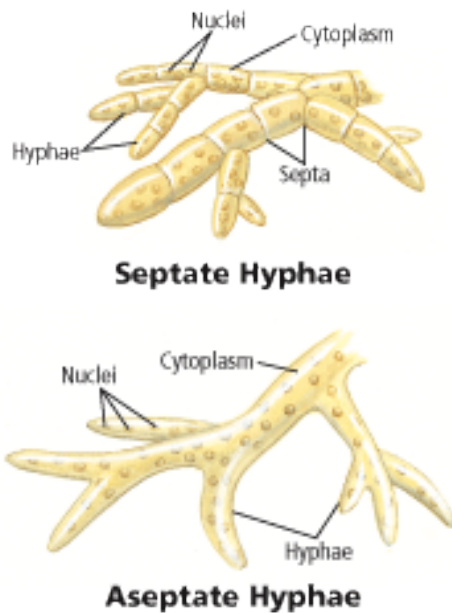
7. In the collection of a botanical garden, plants are classified according to the environments in which they thrive. Compare descriptions of plants and environments below. What plant in which environment would have large leaves that are covered with a thick upper cuticle, exhibit wide flat blades, and possess large air spaces (chambers) within mesophyll tissue?
 - A. a water lily floating on water.
 - B. a pine tree growing in the cold and dry taiga.
 - C. a cactus growing in a hot, sunny, and dry environment.
 - D. an orchid hanging from a tree in a tropical forest

8. Apart from the fact that they are all eukaryotes (and therefore found within the Eukarya domain), there is no single trait that is common to all protist species. Which of the following is true of **MOST** protists?
- A. they can cause disease.
 - B. they can photosynthesize.
 - C. they reproduce sexually.
 - D. they prefer to live in water-rich environments.
9. Which of the following is **NOT** true of protists?
- A. *Plasmodium*, red algae, green algae, and dinoflagellates are all examples of protists.
 - B. a "protist" is broadly recognized as a eukaryote that is not an animal, fungus, or plant.
 - C. protists are diverse in part due to endosymbiosis, a process by which small, unicellular organisms are engulfed by larger unicellular organisms and eventually evolve to become organelles.
 - D. all protists are unicellular by definition.
10. In the mixotroph protist *Euglena*, which structural components indicate that it is an autotroph?
- A. red eye spot
 - B. flagellum
 - C. plasma membrane
 - D. chloroplasts
11. Which of the following is/was **NOT** caused by protists?
- A. Malaria
 - B. Acquired Immunodeficiency Syndrome (AIDS)
 - C. The Irish potato famine
 - D. Red tides
12. Which of the following groups of algae is/are most closely related to land plants?
- A. green algae
 - B. brown algae
 - C. golden algae
 - D. red algae
13. The theory of endosymbiosis best explains:
- A. Why eukaryotic cells have a nucleus.
 - B. How eukaryotic cells and prokaryotic cells are similar.
 - C. How eukaryotic cells evolved from a prokaryotic cell engulfing another prokaryotic cell.
 - D. How all eukaryotic cells contain chloroplast.
14. Which organisms represent the common ancestor of all photosynthetic plastids found in eukaryotes?
- A. autotrophic euglenoids
 - B. diatoms
 - C. dinoflagellates
 - D. cyanobacteria
15. Spore-producing _____ are in the phylum Apicomplexa?
- A. amoebas
 - B. dinoflagellates
 - C. diatoms
 - D. sporozoans
16. The giant kelp is an example of _____.
- A. A fungi like protist
 - B. A animal-like protist
 - C. algae
 - D. *Paramecium*

17. Hyphae provides a _____ for nutrient absorption
- flexible polysaccharide
 - large surface area
 - chitin membrane
 - nucleus
18. What organism forms a symbiotic relationship with algae or cyanobacteria?
- lichens
 - parasitic fungi
 - saprophytes
 - ascocarps
19. The familiar, above-ground portion of this fungus can be described as what?

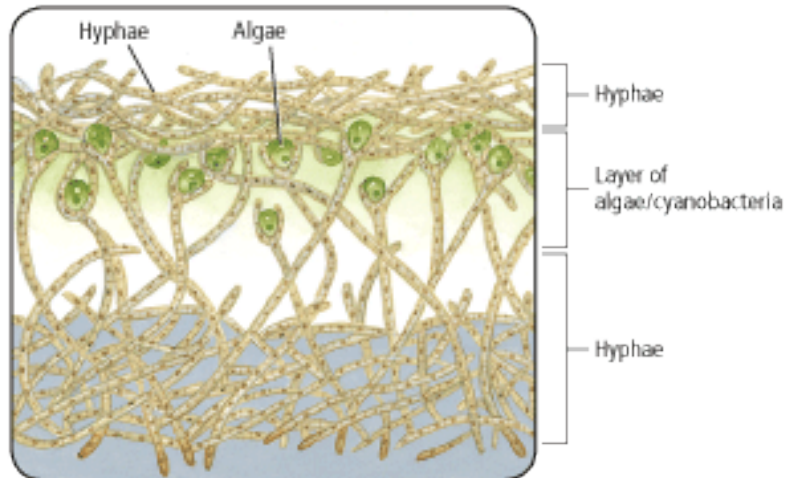


- photosynthetic structure
 - site of mycelium fragmentation
 - reproductive fruiting body
 - soil nutrient absorber
20. What key structural difference exists between these two fungi?

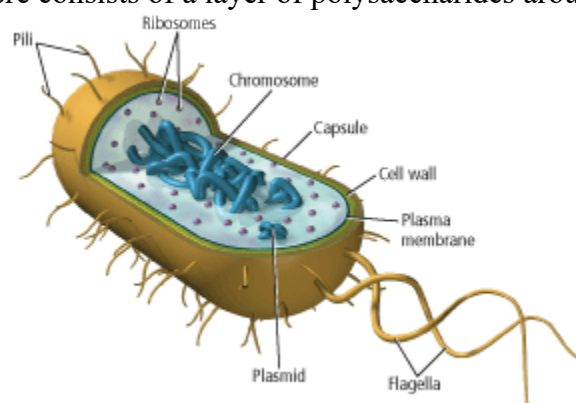


- Cross walls called septa.
 - Cross walls called haustoria.
 - Presence of fruiting bodies
 - Presence of sporangium
21. What process describes fungi being used to break down harmful pollutants?
- Mycorrhiza
 - Bioremediation
 - Photosynthesis
 - gametangium

22. What does the picture below illustrate?

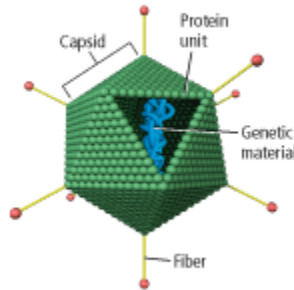


- A. A parasitic relationship
 B. A mutualistic organism
 C. A bread mold
 D. A symbiotic relationship
23. What makes the Chytridiomycota (Chytrids) unique among the fungi?
 A. Reproduce asexually.
 B. Parasitic
 C. Produce flagellated spores.
 D. Not aquatic
24. Which structures are proteins that help the cell attach to surfaces?
 A. Flagella
 B. Ribosomes
 C. Plasmids
 D. Pili
25. What is the significant difference between eubacteria and archaebacteria?
 A. eubacteria inhabit harsher environments.
 B. presence of nucleus in archaebacteria
 C. peptidoglycan in cell walls of eubacteria
 D. archaebacteria photosynthetic
26. Which structure here consists of a layer of polysaccharides around the cell wall?



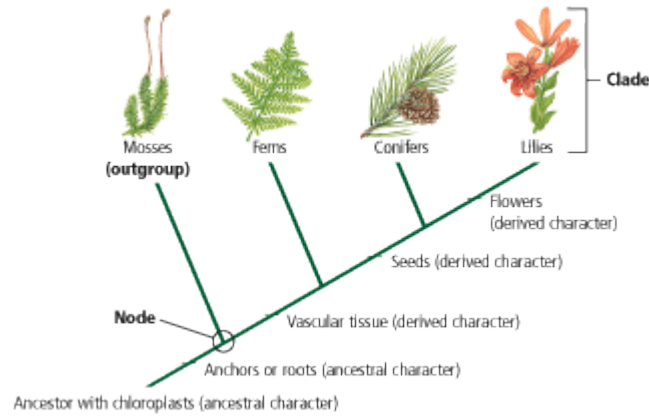
- A. Capsule
 B. Ribosome
 C. Plasmid
 D. flagella
27. How do chemotrophs differ from other autotrophs?
 A. Breakdown hydrogen sulfide
 B. Utilize more light reactions
 C. Prevent nitrogen cycling.
 D. Contain mor chlorophyll.

28. A ____ is a nonliving strand of genetic material within a protein coat.
 A. Archaeobacteria
 B. Bacterial cell
 C. Virus
 D. Nucleic acid
29. Viruses with RNA and a complex replication cycle are called _____.
 A. Archaic bacteria
 B. Capsid
 C. bacteriophages
 D. retroviruses
30. One theory about the origin of viruses suggests they might have come from ____ in cells.
 A. Membranes
 B. Genes
 C. Vacuoles
 D. Bacteria
31. This virus is responsible for causing _____.



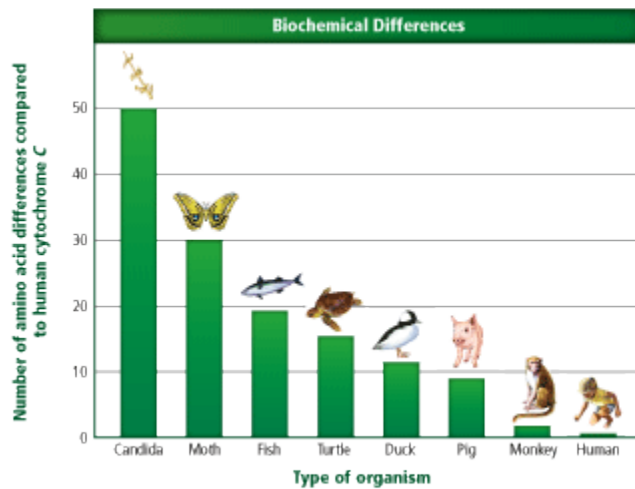
- A. brain shrinkage
 B. flu
 C. aids
 D. common cold
32. What structural similarity exists between species in Protista and Plantae kingdoms?
 A. both have chloroplasts.
 B. chitin in cell walls
 C. cellulose in cell walls
 D. have no cell walls.
33. Which kingdom contains species believed to be more ancient than bacteria?
 A. archaea
 B. plantae
 C. animalia
 D. mammalia
34. The evolutionary history of a species is called its _____.
 A. phylogeny
 B. taxa
 C. species concept
 D. class
35. What did Darwin's analogy of the tree of life suggest?
 A. most species do not have ancestors.
 B. all species derived from trees.
 C. all species were derived from ancestral groups.
 D. most species are unrelated to each other.

36. Which statement is true regarding this cladogram?



- A. mosses and ferns share no ancestral characters.
 B. lilies share ancestral characters with mosses.
 C. flowers are an ancestral character.
 D. flowers evolved before vascular tissues.
37. What is the broadest of all the taxa categories?
 A. phylum
 B. kingdom
 C. domain
 D. order
38. Why is binomial nomenclature important for biological classification?
 A. allows scientists to disregard common ancestors.
 B. encourages scientists to use common names.
 C. provides all species with a specific name.
 D. kingdoms are no longer necessary in classification.
39. _____ is a group of species that are closely related and share a common ancestor.
 A. genus
 B. taxon
 C. kingdom
 D. type
40. Eukaryotic organisms that can be multicellular, unicellular, or colonial are called _____.
 A. cyanobacteria
 B. archaea
 C. protists
 D. insects
41. Early cyanobacteria produced _____ which eventually formed the ozone layer.
 A. hydrogen
 B. proteins
 C. carbon dioxide
 D. oxygen
42. Darwin referred to the process of promoting certain traits by breeding members with those traits as _____.
 A. natural selection
 B. artificial selection
 C. evolution
 D. ancestral breeding
43. A morphological adaptation in which one species resembles another is called _____.
 A. mimicry
 B. camouflage
 C. vestigial adaptation
 D. fitness

44. What are two main components of natural selection?
- vestigial structures and camouflage
 - artificial selection and selective breeding
 - variation and inheritance
 - mimicry and artificial selection
- 45.. Recently evolved traits that do not appear in ancestral fossils are called ____.
- homologous traits
 - ancestral traits
 - primitive traits
 - derived traits
46. This illustration compares amino acid sequences in various kinds of organisms. Which statement is correct based on this information?



- Fish share more amino acid sequences with pigs than with turtles.
 - Monkeys share more amino acid sequences with humans than with fish.
 - Humans and pigs share no amino acid sequences.
 - Turtles and fish share no amino acid sequences.
47. These vertebrate forelimbs are examples of ____.



- homologous structures
 - vestigial structures
 - ancestral development
 - dysfunctional evolution
48. Which of these is an example of a vestigial structure?
- kangaroo's pouch
 - leg attachment site on snake pelvis
 - elephant's trunk
 - light weight bones of bird skeleton
49. The wings of hawks and beetles are ____.
- ancestral forms
 - vestigial structures
 - analogous structures
 - natural selection

*For each of the next 3 questions (50 to 52), select the one organism that is **least** closely related to the other three:*

50. A. seal
 B. bear
 C. penguin
 D. beaver
51. A. frog
 B. snake
 C. lizard
 D. alligator
52. A. robin
 B. bat
 C. sparrow
 D. chicken

For each of the next three questions (53 to 55), choose which term includes the other three: -

53. A. fish
 B. vertebrates
 C. amphibians
 D. animals
54. A. arthropods
 B. insects
 C. crustaceans
 D. millipedes
55. A. genus
 B. order
 C. phylum
 D. species

For each of the next three questions (56 to 58), indicate which of the following groups of organisms are most closely related?

56. A. Lobster – grasshopper
 B. Clam – crayfish
 C. shrimp – tuna
 D. tuna – squid
57. A. Snake – lizard
 B. Frog – snake
 C. lizard – salamander

 D. fish – salamander
58. A. sponge – coral
 B. coral – jellyfish
 C. jellyfish – squid
 D. clam – sponge

For each of the next five questions (59 to 63), If you find an animal that has the following characteristics, How would you classify this animal?

59. Characteristics: - has no real form, lots of pores, nonmotile, and a tough outer covering.
 A. Echinoderm
 B. coelenterate
 C. sponge
 D. coral
 E. mollusk

60. Characteristics: - a backbone, scaly legs and claws, warm-blooded, and lays eggs.
 A. Reptile
 B. amphibian
 C. fish
 D. mammal
 E. bird
61. Characteristics: - jointed appendages, segmented, and an exoskeleton'
 A. annelida
 B. coelenterate
 C. mollusk
 D. arthropod
 E. echinoderm
62. Characteristics: - soft – bodied, motile and nonmotile at different times of its life cycle and contains stinging cells.
 A. Annelida
 B. coelenterate
 C. mollusk
 D. arthropod
 E. echinoderm
63. Characteristics: - it has gills at some stage of its life, undergoes metamorphosis, is cold-blooded, and lives in moist habitats.
 A. Amphibian
 B. Annelid
 C. fish
 D. reptile
 E. coelenterate

Refer to the following table to answer questions 64- 66:

<u>Animal I</u>	<u>Animal II</u>	<u>Animal III</u>	<u>Animal IV</u>	
<u>Animal V</u>				
Hair skin	feathers	smooth skin	scaly skin	scaly
Backbone	shelled egg	backbone	shelled egg	gills
Placenta	claws	non-shelled eggs	claws	aquatic

64. Animals I-IV all belong to the phylum of animals called
 A. Reptiles
 B. birds
 C. chordates
 D. mammals
65. To which class does the animal in IV belong?
 A. Mammals
 B. birds
 C. amphibians
 D. reptiles
66. To what phylum does animal V belong?
 A. Mollusca
 B. Annelida
 C. Echinodermata
 D. Chordata

SECTION B:

Instruction: Answer ALL questions in this section in the spaces provided.

Question 1:

Figures 1 and 2 represents the life cycle of a fern and moss respectively.

(a) Clearly label the following structures on both life cycles below: **Sporophyte, gametophyte** (2)

(b) Clearly label in the life cycles where the processes of **meiosis** and **mitosis** occur. (2)

Figure 1: Life cycle of a Fern

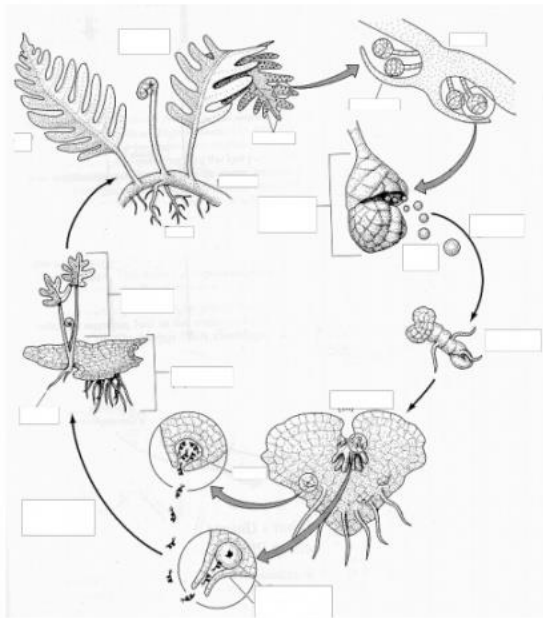


Figure 2:-

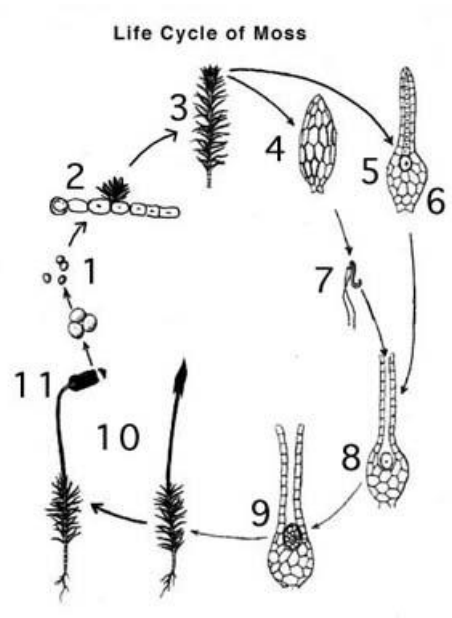
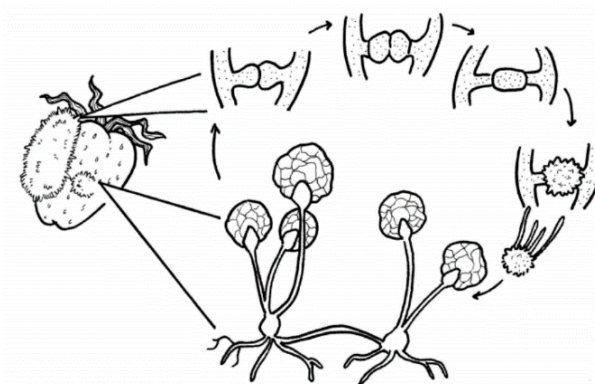
**Question 2:**

Figure 3:



(a) Identify the phylum of fungi represented by the life cycle in Figure 3: Phylum _____

(1)

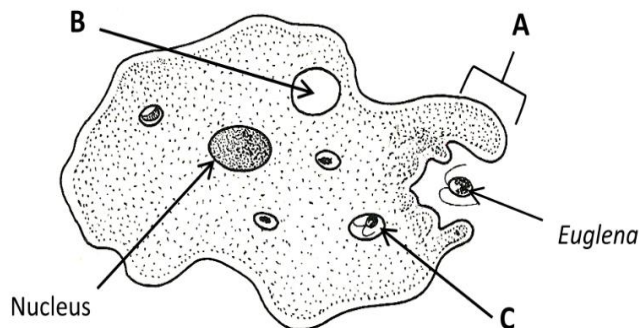
(b) Clearly label on Figure 3 where processes of **plasmogamy** and **karyogamy** occur.

(2)

Question 3:

Carefully study the drawing and answer the questions in the space provided below.

(b) The diagram below shows a unicellular organism.



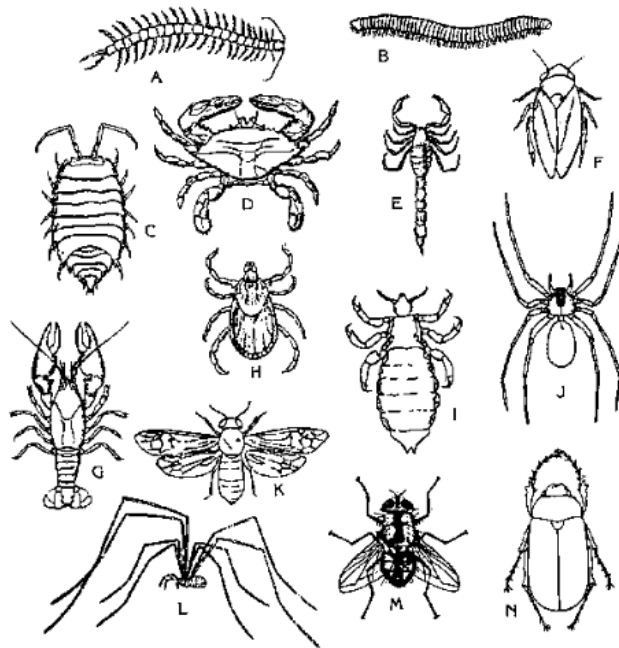
- (i) Name the unicellular organism shown in the diagram **and** the kingdom to which it belongs.
- (ii) Suggest a typical habitat for this organism.
- (iii) The organism labelled *Euglena*, is a prey species of the larger organism. Name structure **A** forming around this prey.
- (iv) Give **one** function for structure **A** named at part (iii) above, other than engulfing prey.
- (v) Name the structure labelled **B** **and** state its function.
- (vi) Name the structure labelled **C**.
- (vii) Describe **two** ways in which the cell of this organism differs to a typical bacterial cell.

Answers to Question 3

- (i) _____ (2 marks)
- (ii) _____ (1 mark)
- (iii) Structure A _____ (1 mark)
- (iv) Function of structure A _____ (2 mark)
- (v) Structure B _____ (1 mark)
- Function of structure B _____ (2 mark)
- (vi) Structure C _____ (1 mark)
- (vii) _____ (4 marks)

Question 4:

Study the pictures below. Each organism has been assigned a letter. Using this letter place each organism in its appropriate group.



Myriapoda _

Crustacea _

Insecta _

Arachnida _

END OF EXAMINATION