

BIOLOGY 2201

Sample Midyear Examination

Part 1: Using the answer key provided, select the letter that best answers the question.

1. Biology is the study of:
 - a. animals only.
 - b. small living things only.
 - c. plants.
 - d. all living things.
2. Which statement is NOT part of the cell theory?
 - a. Cells vary in size but have the same shape.
 - b. All organisms are made of one or more cells.
 - c. All cells carry on their own life activities.
 - d. New cells arise only from other living cells.
3. Animalia is a:
 - a. kingdom.
 - b. phylum.
 - c. genus.
 - d. class.
4. The scientific name of an organism is formed from its:
 - a. kingdom and phylum names.
 - b. phylum and class names.
 - c. family and genus names.
 - d. genus and species names.
5. Protozoa are divided into phyla based on their means of:
 - a. locomotion.
 - b. reproduction.
 - c. respiration.
 - d. nutrition.
6. Which of the following is NOT a characteristic of organisms?
 - a. reproduction
 - b. unlimited size
 - c. growth
 - d. energy use
7. Modern taxonomists classify organisms according to their:
 - a. evolutionary relationships.
 - b. kind of environment.
 - c. age.
 - d. seasonal variation.
8. A botanist discovers a new species of plant in a tropical rainforest. After observing its anatomy and life cycle, the following characteristics were noted: no vascular tissue, gametophyte is the dominant generation and no seeds. To what classification is this plant most likely related?
 - a. conifers
 - b. ferns
 - c. flowering plants
 - d. mosses
9. A compound microscope differs from a simple microscope in that a compound microscope has two:
 - a. eyepieces.
 - b. lenses.
 - c. different light sources.
 - d. objectives.

10. A cell with 96% concentration of water molecules and 4% concentration of dissolved substances is placed in a hypertonic solution. The water molecule concentration of the solution could be:
- 98%.
 - 96%.
 - 94%.
 - Not enough information given.
11. Viruses consist of:
- an inner cytoplasm and an outer, folded cell membrane of lipids.
 - a central core of nucleic acid and an outer coat of protein.
 - a nucleus, cytoplasm, and polysaccharide cell wall.
 - cell membranes and cell walls.
12. Which term refers to yeast?
- budding
 - gills
 - imperfect fungi
 - multicellular
13. The elimination of waste substances from an organism is called:
- metabolism.
 - excretion.
 - growth.
 - osmosis.
14. Which of the following are characteristics of phylum porifera (sponges)?
- mesoderm.
 - coelom.
 - bilateral symmetry.
 - asymmetry.
15. The organism that causes the food poisoning botulism is a:
- bacteria.
 - protist.
 - virus.
 - fungus.
16. The coarse adjustment knob is used to:
- regulate light.
 - concentrate light on the specimen.
 - focus with the high-power objective.
 - focus with the low-power objective.
17. The main function of glucose is:
- to act as an enzyme.
 - to assist in protein synthesis.
 - to form nucleic acids.
 - to act as a source of energy.
18. The founder of modern taxonomy is considered to be:
- Aristotle.
 - Ray.
 - Linnaeus.
 - Theophrastus.
19. Which of the following is a sporozoan that causes malaria?
- Plasmodium
 - Myxomycota
 - virus
 - Anopheles

20. All fungi are:
- a. saprobes.
 - b. parasites.
 - c. multicellular.
 - d. heterotrophs.
21. If you were designing a key to separate the major groups of invertebrates which would be the best characteristics to use?
- a. life style, reproduction, symmetry
 - b. body cavity, digestion, symmetry
 - c. life style, body cavity, symmetry
 - d. body cavity, tissue layers, symmetry
22. Fungi are organisms mainly responsible for:
- a. photosynthesis.
 - b. chemosynthesis.
 - c. decomposition.
 - d. flowers.
23. Which of the following organisms are in the same kingdom?
- a. protozoa and bacteria
 - b. grasshopper and protozoa
 - c. bacteria and protists
 - d. algae and protozoa
24. All algae are:
- a. flagellated.
 - b. photosynthetic.
 - c. unicellular.
 - d. prokaryotic.
25. As the surface of a cell increases in size, the volume of the cell:
- a. increases proportionately more than the surface area.
 - b. increases about the same as the surface area.
 - c. decreases.
 - d. does not change.
26. The single characteristic that distinguishes birds from all other animals is (are):
- a. feathers.
 - b. cloaca.
 - c. gizzard.
 - d. kidney.
27. The total magnification of a compound microscope is 45X. If the ocular power is 15X then the objective power is:
- a. 1X
 - b. 3X
 - c. 10X
 - d. 30X
28. Which of the following is ways of reproducing is found in birds?
- a. internal fertilization, external development
 - b. external fertilization, internal development
 - c. external fertilization, external development
 - d. internal fertilization, internal development
29. The evolutionary history of a group of organisms is represented by a:
- a. fossil bone.
 - b. sample of DNA.
 - c. phylogenetic tree.
 - d. taxonomic key.

30. Which of the following has a skeleton composed of cartilage?
- a. shark
 - b. trout
 - c. cod
 - d. goldfish

31. Asexual reproduction:
- a. involves two parents.
 - b. results in offspring identical to the parent.
 - c. is necessary for the continued life of the organism.
 - d. occurs in all organisms.

Use the following table of classification to answer questions 32-33 below:

Taxonomic Categories for Koala, Red Kangaroo and Brown Bear

<i>KOALA</i>	RED KANGAROO	BROWN BEAR
Animalia	Animalia	Animalia
Chordata	Chordata	Chordata
Mammalia	Mammalia	Mammalia
Marsupialia	Marsupialia	Carnivora
Phalangeridae	Macropodidae	Ursidae
<i>Phascolarctos cinereus</i>	<i>Megaleia rufa</i>	<i>Ursus arctos</i>

32. Identify the species name of the **red kangaroo** :
- a. Animalia
 - b. Macropodidae
 - c. Marsupialia
 - d. *Megaleia rufa*
33. Which of the two species above are most closely related?
- a. Koalas and brown bears, because they are both bears
 - b. Kangaroos and Koalas because they are both members of the same order
 - c. Brown bears and kangaroos because they are both members of the same class
 - d. Koalas and kangaroos because they both come from Australia
34. Slime molds and water molds are:
- a. autotrophs.
 - b. fungi.
 - c. protists.
 - d. algae.
35. Cells that use a great amount of energy usually contain numerous
- a. lysosomes
 - b. ribosomes
 - c. vacuoles
 - d. mitochondria
36. Processes that require energy and work against a concentration gradient include which of the following?
- I. facilitated diffusion
 - II. active transport
 - III. osmosis
- a. I only
 - b. II only
 - c. I and II only
 - d. I, II and III

37. Which of the following statements about the cell membrane is correct?
- it has a rigid structure composed of cellulose
 - it prevents the exit of all substances from the cell
 - it is a fluid filled organelle surrounding the nucleolus
 - it is a two layered structure composed of lipids and proteins
38. Components of the fungi mycelium include which of the following?
- hyphae
 - stolons
 - sporangiophores
- I only
 - I and III only
 - II and III only
 - I, II, and III
39. An image seen by a scanning electron microscope shows:
- not much detail
 - the surface only
 - coloured tissue
 - internal structures
40. All viruses are:
- bacteriophages.
 - incapable of reproducing unless inside a host cell.
 - capable of chemosynthesis under certain circumstances.
 - usually much smaller than viroids.
41. The magnification of a compound microscope is the ratio of:
- image size to object size.
 - object size to image size.
 - ocular to objective magnifying power.
 - objective to ocular.
42. Taxonomic keys:
- cannot be used for protozoans and algae.
 - can only be used for vertebrates.
 - are usually dichotomous.
 - are of little value to most taxonomists.
43. Which group of terms is in the CORRECT order from most general to most specific?
- species, phylum, genus, kingdom
 - genus, species, kingdom, phylum
 - kingdom, phylum, genus, species
 - phylum, kingdom, species, genus
44. When taxonomists use information about DNA and RNA, they are classifying organisms on the basis of:
- structural similarity.
 - biochemistry.
 - cytology.
 - behavior.
45. Which one of the following characteristics is the best indicator of life?
- structure (shape)
 - reproduction
 - movement
 - oxygen consumption
46. Which process provides most of the oxygen found in the Earth's atmosphere?
- photosynthesis
 - aerobic respiration
 - hydration synthesis
 - fermentation

47. The removal of the cuticle from a leaf would most likely result in an increase in the leaf's:
- surface area.
 - food production.
 - water loss.
 - fungus resistance.
48. Photosynthesis is the process by which:
- the potential energy of glucose is transferred to ATP molecules.
 - glucose is gradually broken down to form lactic acid or alcohol.
 - two glucose molecules combine to form maltose and water.
 - light energy is converted into the chemical energy of glucose.
49. Many bacteria that enter the circulatory system are engulfed and destroyed by:
- phagocytic white blood cells.
 - pinocytic red blood cells.
 - plasma.
 - platelets.
50. In the process of respiration, aerobic organisms generally use:
- carbon dioxide and give off molecular oxygen.
 - molecular nitrogen and give off carbon dioxide.
 - carbon dioxide and give off molecular nitrogen.
 - molecular oxygen and give off carbon dioxide.
51. Which substances must a green plant obtain from its environment to carry on photosynthesis?
- glucose and water
 - oxygen and chlorophyll
 - carbon dioxide and water
 - carbon dioxide and oxygen
52. Which substance is represented by X in the word equation shown?
glucose + X + enzymes → water + carbon dioxide + ATP
- alcohol
 - chlorophyll
 - oxygen
 - lactic acid
53. Which activity is NOT an example of heterotrophic nutrition?
- An eagle kills and eats a snake.
 - A tapeworm absorbs food in a human intestine.
 - A mushroom decomposes a dead log.
 - An algal cell synthesizes food during photosynthesis.
54. Photosynthetic products are transported from the leaf to the rest of the plant through:
- guard cells.
 - phloem tissue.
 - xylem tissue.
 - cambium cells.
55. Which statement describes an **EXCEPTION** to the cell theory?
- Cells arise from previously existing cells.
 - The cell is the basic unit of function in animals.
 - Mitochondria and chloroplasts can reproduce within the cell
 - The cell is the basic unit of structure in plants
56. Which structures are found in every living cell?
- a plasma membrane and cytoplasm
 - chloroplasts and mitochondria
 - a cell wall and nucleus
 - centrioles and chromosomes

57. In a microscope, to adjust the amount of light you would adjust the:
- objective
 - ocular
 - diaphragm
 - stage
58. The presence of which organelles would identify an organism as an autotroph?
- nuclei
 - lysosomes
 - chloroplasts
 - cilia
59. Which structure in a plant cell is chiefly composed of a non-living material known as cellulose?
- cell membrane
 - nucleus
 - mitochondrion
 - cell wall
60. The process in which the net movement of molecules is from a region of lower concentration to a region of higher concentration is known as:
- active transport.
 - diffusion.
 - osmosis.
 - passive transport.
61. An organism was added to a test tube containing water, which was then attached to a gas analyzing apparatus. The gas analyzer indicated that the organism was releasing the gas oxygen when placed in bright sunlight. Which type of organism was most probably added to the test tube?
- fresh-water animal
 - aquatic plant
 - amoeba
 - virus
62. The main result of aerobic respiration is the:
- conversion of radiant energy into chemical energy.
 - production of lactic acid as an end product.
 - storage of energy in a polysaccharide.
 - production of ATP from the breakdown of glucose.
63. Which prominent feature of a stained cell would enable the student to identify it as a plant cell?
- nucleus and vacuole
 - vacuole and cytoplasm
 - chloroplast and cell wall
 - ribosome and centrosome
64. Which organisms add more oxygen to the atmosphere than they remove?
- grasshoppers
 - bread molds
 - corn plants
 - mushrooms
65. In vascular plants, the absorption of water from the soil into root hairs depends principally upon the presence of a:
- phototropic response by the root hairs.
 - geotropic response by the conducting tissue.
 - higher concentration of water in the soil than in the root hairs.
 - higher concentration of water in the root hairs than in the soil.
66. In bryophytes, intercellular transport is accomplished by diffusion, since bryophytes:
- live only in dry environments.
 - lack vascular tissue.
 - require no minerals from the soil.
 - contain vascular tissue.

67. Red blood cells contain a higher concentration of potassium than the surrounding blood plasma does. This higher concentration is maintained by the process of:
- a. cyclosis.
 - b. osmosis.
 - c. simple diffusion.
 - d. active transport.
68. A similarity in the aerobic respiratory activity of animals is the:
- a. gases used and produced.
 - b. net gain of four ATP molecules.
 - c. type of alcohol produced.
 - d. temperature of the respiratory organs.
69. Aerobic respiration is a life function that occurs in:
- a. animal cells, only.
 - b. green plant cells, only.
 - c. nongreen plant cells, only
 - d. most animal and plant cells.
70. Active transport is different from passive transport in that active transport involves:
- a. the movement of molecules from high concentration to low concentration.
 - b. an expenditure of energy.
 - c. the use of ribosomes.
 - d. a process which occurs only in the cells of simple plants and animals.
71. Which process requires the presence of oxygen to release energy?
- a. aerobic respiration
 - b. photosynthesis
 - c. fermentation
 - d. anaerobic respiration
72. The process of osmosis would explain the net movement of water into a cell if the percentage of :
- a. water was 90% inside the cell and 95% outside the cell.
 - b. protein was 30% inside the cell and 35% outside the cell.
 - c. water was 95% inside the cell and 90% outside the cell.
 - d. water and protein were equal inside and outside the cell.
73. Which life activity is illustrated by the diagrams in Figure 1-1 of the same cell?
- a. reproduction
 - b. transport
 - c. excretion
 - d. growth
74. The chemical energy stored in glucose is released by:
- a. cellular respiration.
 - b. growth.
 - c. maintenance.
 - d. repair.
75. The process that is unnecessary to the life of an individual organism but necessary for the continued existence of that type of organism is:
- a. asexual reproduction.
 - b. sexual reproduction.
 - c. reproduction.
 - d. vegetative reproduction.

ESSAYS: 25 MARKS

Students must answer any **5 questions**.

- Define **either** biogenesis or spontaneous generation. (1 mark)
 - Describe an experiment from Redi, Needham, Spallanzani or Pasteur and explain how it supports biogenesis or spontaneous generation. (4 marks)
- With the aid of a diagram, draw a plant cell and label **5 (five)** of its organelles. State the structure and function of each organelle. (5 marks)

3. What would happen to an animal cell with an internal salt concentration of 0.8% if it were placed in a salt solution of the following concentrations? (Diagrams will be necessary) (5 marks)

- a) 0.02% b) 0.8% c) 20.0%

4. Using a table compare and contrast the processes of photosynthesis and respiration. [5 marks]

5. Distinguish between the 6 [six] kingdoms based upon the following characteristics. **Cell type, Cell structure, and Body form, Nutrition, Nervous system.** (4 marks)

5 b) Why are virus's not included in the kingdom system of classification? (1 mark)

6. List 5 [five] adaptations that allowed plants to adapt to life on land. (5 marks)

7. To identify primates, several characteristics are considered, such as structure of the skull, teeth, hands and feet. Use information from pictures A- F of the top of the skulls and hands to identify the primates described in the key. Place the correct name in the space provided, next to the letter of each picture. (5 marks)

A. _____

B. _____

C. _____

D. _____

E. _____

F. _____