2023 MOCK FEBRUARY BIOLOGY 1
OBJECTIVE TEST, FEBRUARY 2023
SUBJECT: BIOLOGY FORM: SHS 3 DURATION: 1 HOUR 40 MINUTES

Answer **all** *questions.* **Circle** *the correct answer.*

1. Which of the following is **not** an example of *heterotrophic mode of nutrition?*
a. symbiosis b. parasitism
c. holophytism d. saprophytism

2. An organism whose source of carbon is inorganic is likely to be a /an
a. heterotrophic organism
b. autotrophic organism c. symbiotic organism
d. parasitic organism

3. A change in the environment of an organism is termed
a. sensitivity b. impulse c. response
d. stimulus

4. The fine adjustment of the light microscope is used to
a. admit more light into the microscope
b. focus the object under low power
c. focus the object under high power
d. raise the stage upwards

5. A prepared slide to be observed under the microscope must be on the
a. condenser b. stage
c. diaphragm d. nose piece

6. Which of the following associations can upset the balance of nature?
a. epiphytism b. parasitism
c. symbiosis d. saprophytism

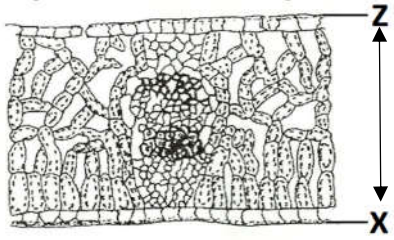
7. An organism is considered as *heterotroph* when it
a. feeds on inorganic food
b. feeds on already manufactured food
c. fixes atmospheric nitrogen
d. respires anaerobically

8. An example of autotrophic organisms include the following **except**
a. euglena b. chlamydomonas
c. hydra d. spirogyra

9. Which of the following organisms feeds both *autotrophically* and *heterotrophically?*
a. hydra b. paramecium
c. mucor d. euglena

10. Autotrophs are also described as
a. consumers b. decomposers c. carnivores
d. producers e. herbivores

11. The line **XZ** in the diagram below represents an actual distance of 10.0cm and the length of the diagram is 5.0cm. What is the magnification of the diagram?



a. X0.2 b. X0.5
c. X2.0 d. X50.0

12. The mode of nutrition which describes feeding habit in animals is
a. autotrophic b. holozoic c. holophytic
d. saprophytic e. photosynthesis

13. Which of the following groups consist of heterotrophs?
a. mucor, chlamydomonas and euglena
b. spirogyra, mucor and mushroom
c. man, mucor, and mushroom
d. man, maize and cowpea

14. Temporary slides prepared to be examined under microscope are always covered with a cover slip in order to
a. avoid breaking
b. make the object appear clearly
c. prevent the object from falling
d. avoid wetting the objective lens

15. A prepared slide to be observed under the microscope must be on the
a. condenser b. stage c. diaphragm
d. nose piece

16. Which of the following parts of a light microscope contains a lens?
a. diaphragm b. eye piece
c. fine adjustment d. nose piece

17. The body symmetry of Hydra is
a. radial b. bilateral
c. longitudinal d. transverse

18. Which of the following is **not** a constituent of **DNA?**
a. purine b. phosphate c. cytosine
d. deoxyribose e. uracil

19. The **haploid number** of chromosomes in man is
a. 48 b. 46 c. 42 d. 24 e. 23

20. **Species** can be define as the group of organisms that
a. resemble each other and live in the same habitat
b. are of common origin and are always found together
c. resemble each other and can interbreed freely
d. resemble each other and occupy the same niche

21. Which of the following is not true about **gene mutation?** It
a. introduces new trait into a population
b. causes changes in the DNA
c. may have unnoticeable effect on the phenotype
d. always affects the chromosome number
e. is a source of new gene

22. Four cells with osmotic potential equivalent to that of 3% salt solution were immersed respectively in solutions of different concentrations labelled as followed:
I = 4% salt solution II = 6% salt solution
III = 1% salt solution IV = 10% salt solution
V = 5% salt solution

23. *Which of the solutions will cause an increase in the osmotic pressure within the cell?*
a. I b. II c. III d. IV e. V

24. Which of the following statements is **not** true of **osmotic process?**
a. there must be a selectively permeable membrane
b. the two solutions must be of different concentrations initially
c. it involves the movement of only the water molecules
d. equilibrium is reached when there is equal distribution of water molecules
e. the two solutions are of equal concentration at the beginning of the experiment

25. At which of the following stages of **cell division** can the cell be said to be resting?
a. anaphase b. telophase c. prophase
d. interphase e. metaphase

26. All hereditary characters in a cell are passed on from parent – cell to daughter cell through the process of
a. mitosis, interphase b. meiosis, prophase
c. fertilization, metaphase d. implantation, anaphase e. gestation, telophase

27. What is the name given to the structure labelled A at this stage of cell division?
a. chromatin b. chromosome c. chromatid
d. gene e. daughter chromosome

28. Plants cells do not burst when placed in hypotonic solution because
a. rigidity is provided by the cell wall
b. the influx of solvent is the same in opposite direction
c. excess water is extruded by the membrane
d. osmosis has no effects on plant cell

29. The protoplasm of the cell consists of the
a. cytoplasm only b. nucleus only
c. nucleus and cytoplasm
d. nucleus, cytoplasm and membrane

30. When red blood cells are placed in a hypertonic solution, they will
a. absorb ions b. become turgid
c. become wrinkled d. undergo haemolysis

31. The term Diffusion refers to the movement of particles
a. across a semi –permeable membrane
b. from one region to another
c. from a region of lower concentration to a region of higher concentration
d. from a region of higher concentration to the region of lower concentration

32. Protein synthesis occurs in the
a. Golgi bodies b. mitochondria
c. plasma membrane d. ribosome

33.. The shrinking of the cytoplasm away from the cell wall is referred to as
a. active transport b. osmosis
c. plasmolysis d. translocation

34. Which of the following processes is brought about by diffusion?
a. shrinking of cell in hypertonic solution
b. passage of water from the soil into the root hair
c. bursting of the erythrocytes in hypotonic solution
d. passage of digested food from the villi to the blood

35. One important function of the cell membrane is to
a. offer protection against mechanical injury
b. regulate the movement of substances to and from the cells
c. give a definite shape to the cell
d. provide a site for chemical processes

36. The movement of substances against concentration gradient in an organism is referred to as
a. active transport b. diffusion

c. osmosis d. rapid translocation

37. The cell membrane consists of
a. carbohydrates and lipids
b. vitamins and proteins
c. lipids and proteins d. water and sugar

38. Which of these organelles absorbs light energy?
a. ribosome b. chloroplast
c. mitochondria d. lysosome

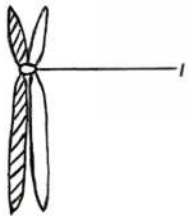
39. Which of the following organelles is the site of energy production?
a. mitochondria b. endoplasmic reticulum
c. nucleolus d. Golgi apparatus

40. Which of the following organelles are likely to be present in cells that are actively respiring and Photosynthesizing?
a. nucleus and centrioles
b. lysosomes and ribosomes
c. endoplasmic reticulum and Golgi bodies
d. chloroplast and mitochondria
e. food vacuoles and contractile vacuoles

41. What is the function of ribosome in the cell?
a. manufacture of carbohydrates
b. manufacture of proteins
c. manufacture of lipids
d. excretion of waste products

42. Which of the following processes is **not** applicable to the reaction of a cell to the concentration of a liquid medium?
a. osmosis b. haemolysis c. diffusion
d. plasmolysis e. radiation

*The diagram below represents a chromosome yet to divide. Use it to answer questions **43 and 44.***



43. The part labelled **I** represents
a. single chromatid b. chromosome
c. gene locus d. centromere e. chiasmata

44. What does the shaded portion represent?
a. allele b. chiasma c. chromatid
d. spindle e. centriole

Below is a list of levels of organization in organisms. Use it to answer questions 45.

I. Tissue II. System III. Cell IV. Organ

45. The correct sequence of the levels in an increasing order of complexity is
a. I → II → III → IV
b. III → I → IV → II
c. III → IV → I → II
d. IV → III → I → II

46. Which of the following is not true of **nucleus** of a living cell? It contains
a. chromosomes b. nucleolus
c. nucleoplasm d. chromatids e. ribosomes

47. Which of the following is not likely to be found in the cell of a ripe tomato fruit?
a. plastids b. chlorophyll
c. cellulose cell wall d. mitochondrion
e. mineral salt

48. Osmosis can be defined as diffusion of
a. atoms and molecules through a membrane to an area of high concentration
b. water molecules for a dilute solutions to a concentrated solution across permeable membrane
c. water molecules from an area of high concentration to an area of low concentration
d. water molecules from a dilute solution to a concentrated solution through a semi permeable membrane

49. Which of the following processes is responsible for the increase in length and dry mass in a root tip?
a. meiosis b. absorption c. mitosis
d. conjugation e. fertilization

50. How many chromosomes are found in the human ovum?
a. 46 b. 23 c. 33 d. 13 e. 43

51. Which of the following is a similarity between a typical animal cell and a typical animal cell? The presence of
a. cellulose cell wall b. chlorophyll
c. centrally placed nucleus d. large vacuole

52. The scientist who discovered the cell while examining a thin slides of cork under the microscope was
a. Theodor Schwann b. Felix Dujardin
c. Robert Hooke d. Charles Darwin

53. In which of the following parts is the chromosome found?
a. Nucleus b. Golgi bodies
c. cytoplasm d. cell membrane

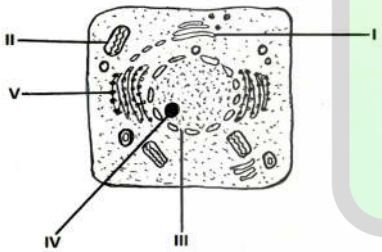
54. Which of the following is a function of the chromosome?
a. transmission of hereditary trait
b. protein synthesis c. excretion d. energy production e. manufacture of enzymes

55. The two important physical processes involved in the absorption and transport of materials in plants are
a. diffusion and plasmolysis
b. cohesion and adhesion
c. flaccidity and turgidity
d. osmosis and diffusion
e. plasmolysis and capillarity

56. The process by which plants manufacture food from carbon dioxide and water using energy from the sun is termed
a. chemosynthesis b. photosynthesis
c. autotrophism d. heterotrophism

57. In which of the following is cellulose cell wall present?
a. amoeba b. mammalian white blood corpuscle c. spirogyra d. paramecium

*The diagram below illustrates the structure of a cell. Use it to answer auestions **58 and 59.***



58. The structure that produces the energy required by the cell is labelled
a. I b. II c. III d. IV e. IV

59. The structure labelled V is the
a. mitochondrion b. ribosome
c. nucleus d. centriole e. nucleolus

60. Spermatogenesis and Oogenesis are both terms used to describe
a. mitosis b. meiosis
c. mating d. implantation

61. Which of the following is the carrier of hereditary materials?
a. centriole b. cytoplasm c. nucleolus
d. chromosome e. lysosome

62. One of the differences between plant and animal cells is that in plants
a. cells have less distinct outline, but animal cells have distinct outline
b. cell wall is made up of cellulose, but animal cell is made up of chitin
c. large vacuoles are present, but absent in animals
d. plastids are absent, but present in animal cell
e. carbohydrates are stored, but as glycogen in animals

63. Higher organisms use a transport system and not diffusion only to distribute nutrients because
a. the ratio of their surface area to volume is small
b. metabolic waste products diffuse to the surface of the organisms
c. the rate at which nutrients and other substances diffuse increase
d. substances to be transported move shorter distance to reach the numerous cells.
e. the internal structures of the organisms are in the direct contact with the environment

64 The cell membrane of a cell is said to be semi – permeable because
a. it allows only large molecular substances to pass through it into the cell
b. it is actively involved in energy production in the cell
c. it actively allows all substances to pass through it by diffusion
d. it is actively selective in allowing substances to pass through it

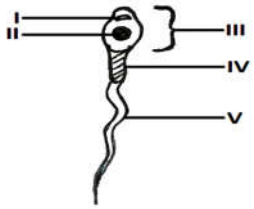
65. Which of the following **levels of organization** in living things is in the correct sequence, starting from the most complex to the simplest?
a. tissue → cell → organ → system
b. system → organ → tissue → cell
c. cell → tissue → system → organ
d. cell → tissue → organ → system

66 Which of the following is **not** a cell **organelle**?
a. Golgi body b. nucleus c. fat droplets
d. ribosome e. endoplasmic reticulum

67. Movement of water across a semi – permeable membrane from a weaker solution to stronger solution is known as
a. transpiration b. diffusion
c. active transport d. plasmolysis e. osmosis

68. In which of the following structures will cell undergoing **meiosis** be seen?
a. at the apices of stem and root
b. in the cortex of the stem
c. in the palisade mesophyll of the leaf
d. in the ovary of a flower

*Below is the drawing of the mammalian spermatozoon. Use it to answer questions **69 – 71***



69. Which of the labelled structures is the nucleus?
a. I b. II c. III d. IV e. V

70. Which of the following labelled structures secrets enzymes which facilitates penetration of the egg?
a. I b. II c. III d. IV e. V

71. Which of the following labelled structures is similar to the locomotory structure in **Euglena?**
a. I b. II c. III d. IV e. V

72. Which of the following statements is **not** true about chromosomes?
a. each chromosome is made up of two chromatids
b. body cells have diploid number of chromosomes
c. homologous chromosomes do not occur in pairs naturally
d. the sex cells have haploid number of chromosomes

73. Which of the following **organelles** helps to remove excess water from cells?
a. mitochondria b. ribosome
c. contractile vacuoles d. golgi body

74. Which of the following processes occurs by ***diffusion***?
a. re - absorption of water in kidney tubules
b. entry of water into the cytoplasm of unicellular animals
c. absorption of water in the large intestine
d. exchange of nutrients between a mother and the foetus
e. movement of water in and out of living cell

75. The organelle involved in the transport of substances within a cell is
a. golgi body b. endoplasmic reticulum
c. ribosome d. mitochondrion

76. Which of the following processes takes place when a plant cell is put in a hypotonic solution?
a. water moves into the cell and the cell bursts
b. water leaves the cell and the cell becomes flabby
c. water moves into the cell and the cell becomes turgid
d. the cell becomes plasmolysed

77. The site for production of ATP in a cell is
a. ribosome b. cytoplasm
c. golgi body d. mitochondria

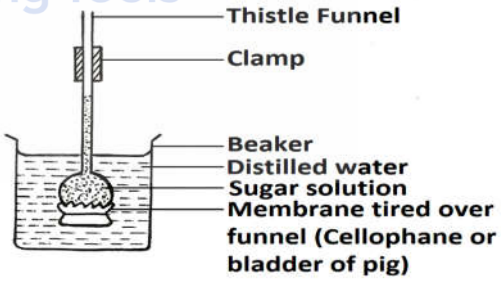
78. The living material of the cell consists of
a. nucleus and cytoplasm
b. cytoplasm and vacuoles
c. cytoplasm and cell membrane
d. nucleus and cell membrane

79. The importance of the concentration of chloroplast in the palisade layer of a leaf is for maximum exposure to
a. carbon dioxide b. Light
c. water d. oxygen

80. Which of the following occurrences is **not** a feature of meiosis?
a. formation of four haploid cells
b. two successful nuclear cell division
c. pairing of homologous chromosomes at prophase
d. formation of two diploid cells

81. The cytoplasm of the cell is considered a very important component because it
a. regulates amount of energy in the cell
b. suspends all cell organelles
c. is the outermost part of the cell
d. is solely responsible for cell division

*Use the diagram below to answer questions **82 and 83.***



82. After an hour, the level of water in the thistle funnel will
a. rise b. fall
c. remain the same d. double

83. The experiment above is used to demonstrate the process of
a. transpiration b. water culture
c. diffusion d. osmosis

84. In plant cells, the role of the membrane is played by
a. nucleolus b. cell wall
c. cytoplasm d. mitochondrion

85. Red blood cells were found to have burst open after being placed in distilled water for an hour. This phenomenon is known as
a. plasmolysis b. diffusion
c. haemolysis d. wilting

86. Two organelles directly involved in mitotic cell division are
a. nucleus and mitochondrion
b. ribosome and nucleus
c. centriole and golgi bodies
d. nucleus and centriole

87. The following statements about mitotic cell division are correct **except** that
a. it occurs only in young cells
b. it occurs in somatic cells
c. the genetic composition of the daughter cell is the same as that of the parent
d. the genetic composition of the mother cell is the same as that of the daughter cell

88. The immediate product of meiosis in flowering plants is the
a. sporophyte b. gametophyte
c. zygote d. pollen grains

89. **DNA** in eukaryotic cells contained in the
a. central vacuole b. nucleus
c. lysosome d. golgi body

90. **Cytokinesis** of mitosis is the process that ensures that
a. each daughter cell gets the necessary organelles
b. there is distribution of a complete set of genes into each daughter cells
c. daughter cells inherit new genetic combination
d. worn out organelles are excluded from daughter cells

91. A dairy farmer allowed only his best milk producing cow to mate. In succeeding generations of cow, milk production increased. This outcome is an example of
a. artificial selection b. natural selection
c. competition d. cross fertilisation

92. An organism that operates at the **cellular level of organization**, carries out its physiological activities by using its
a. cell membrane b. organelles
c. small size d. cytoplasm

93. The organelle which eliminates water from the body of a protozoan is the
a. plasma membrane b. contractile vacuole
c. nucleus d. cell wall

94. Which of the following cell types has the **least** number of mitochondria?
a. cardiac cells of the heart
b. cells of the cornified layer
c. muscle cells of the bladder
d. muscle cells of the diaphragm

95. A typical plant cell is **mainly** distinguished from an animal cell by the possession of
a. chloroplast and nucleus
b. cell wall and cytoplasm
c. chloroplast and cell wall
d. cell wall and mitochondrion

96. Which of the following processes involves diffusion?
a. opening and closure of the stomatal pores
b. turgidity of herbaceous plants
c. absorption of water through the root hairs
d. absorption of digested food into the villi

97. Which of the following statements is **correct** about the structure of chromosome? A chromosome consist of
a. two chromatids joined at the centromere
b. two chromatids joined at the spindle
c. two chromatin threads joined at the centrioles
d. thread – like structures not joined together

98. Which of the following is **not** an organ?
a. hair b. tongue c. rhizome d. corm

99. One major difference between osmosis and diffusion is that diffusion
a. does not need a semi –permeable membrane
b. does not take place in living tissue
c. takes place only in a liquid medium
d. takes place only in a gaseous medium

100. Which of the following is a difference between mitosis and meiosis?
a. alignment of the chromosomes along the equatorial plane
b. replication of the chromosomes and the cell organelles
c. pairing of homologous chromosomes
d. formation of spindle fibre

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