

**Chapter-1: Lesson on Life**

Read the chapter properly & write down the answer of following creative questions:

❖ **Creative Question: 01**



Fig: A



Fig: B

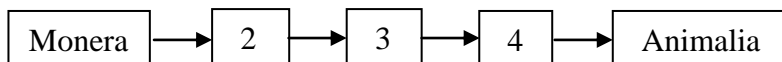
- a) What is conjugation? 1
- b) What do you mean by classification? 2
- c) Which branch of biology may the Fig-A indicate? Explain with reason. 3
- d) Why are Fig: A and Fig-B not included in the same kingdom?—Analyze with logic. 4

❖ **Creative Question: 02**

Mr. Haque, the Biology teacher observed the surrounding trees of school with his students. Later he discussed about a topic showing various trees. Father of that topic is Carolus Linnaeus. At last he analyzes the system of binomial nomenclature introduced by above mentioned scientist.

- a) What is taxa? 1
- b) The members of Kingdom-Fungi cannot prepare food.—Explain. 2
- c) Describe the aim of the subject-matter discussed by the teacher. 3
- d) In the case of naming of man, is the invented system of stem mentioned scientist reflected or not?—Analyze. 4

❖ **Creative Question: 03**



- a) What is conjugation? 1
- b) Why is Biotechnology called Applied Biology? 2
- c) Penicillium belongs to which kingdom in the stem.—Explain. 3
- d) "The gradual advancement of the kingdoms in the stem has been occurred."—Analyze with logic. 4

[N. B:— All the writings will be in a new copy (Khata).]

## Chapter-2: Cells and Tissues of Organisms

Read the chapter properly & write down the answer of following creative questions:

### Creative Question: 01



Fig: A

- a) What is microvilli?
- b) Write down the difference between somatic cell and gametic cell.
- c) Explain the structural characteristics of Fig: A.
- d) How is energy produced in Fig: A?—Analyze with logic.

### Creative Question: 02



Fig: A

- a) What is cristae?
- b) Write down the difference between cell wall and cell membrane.
- c) Explain the structural characteristics of Fig: A.
- d) Analyze and state your opinion if the above figure does not exist in plant.

### Creative Question: 03

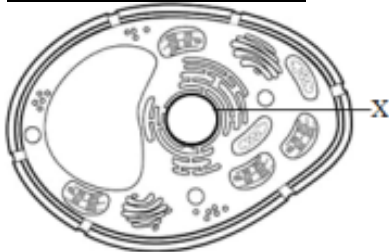


Fig: A

- a) What is oxysome?
- b) What is meant by centrosome?
- c) Explain the structural characteristics of 'X' marked part of Fig: A.
- d) X marked part of Fig: A in the stem controls all the biological activities of the cell.— Evaluate it.

### Creative Question: 04



Fig: A



Fig: B



Fig: C

- a) What is true cell?
- b) What is meant by Golgi body?
- c) Explain the structural characteristics of Fig: C.
- d) Analyze the structural and functional similarities and dissimilarities of Fig: A and Fig: B and Fig: C of the stem

### Creative Question: 05

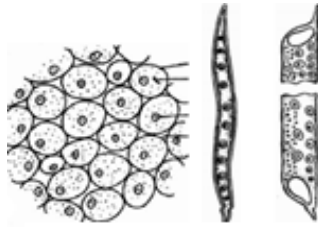


Fig: X Fig: Y Fig: Z

- What is stone cell?
- What is meant by cell vacuole?
- Explain the structural characteristics of Fig: X.
- Analyze the structural and functional similarities and dissimilarities of Fig: Y and Fig: Z of the stem.

### Creative Question: 06

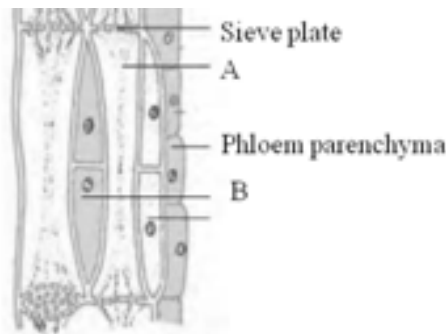


Fig: X

- What is aerenchyma?
- What do you mean by protoxylem and metaxylem.
- Explain the location and structure of 'A' and 'B' marked part in above figure.
- "Fig: X has a great economic importance."—Analyze

### Creative Question: 07

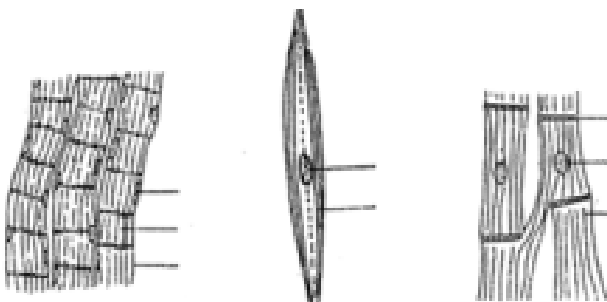


Fig: A

Fig: B

Fig: C

- What is lymph?
- What are the functions of lysosome?
- Write down the differences between Fig: A and Fig: B mentioned above stem.
- "Although the tissue 'A' and 'C' as mentioned in the stem are structurally similar, they are functionally different."—Analyze.

*Name* : ..... *Date* : .....  
*Class* : IX *Subject*: Biology

❖ **Creative Question:**



Fig: X

- What is karyokinesis? 1
- What is meant by interphase? 2
- Draw a labeled diagram of the next stage of the stem. 3
- Justify whether the cell division process in which the Fig: X included is equational division or not. 4

❖ **Creative Question:**

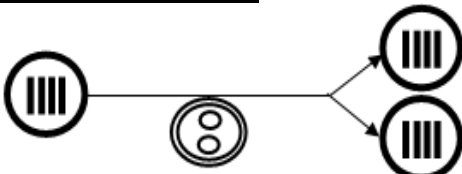


Fig: A

Fig: B

Fig: C

- What is spindle apparatus? 1
- Write down the difference between prophase and telophase. 2
- Explain the role of Fig: B in the change of Fig: A to Fig: C. 3
- Write down the importance of above process. 4

❖ **Creative Question:**

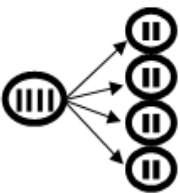


Fig: X

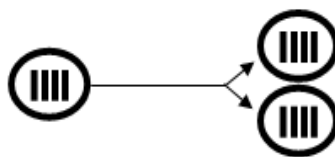


Fig: Y

- What are kinetochores? 1
- What is meant tumour and cancer? 2
- How Fig: X plays role in the flow of generation explain. 3
- Write down the comparison between Fig: X and Fig: Y. 4

**Multiple Choice Questions**
**Chapter One**
**Lesson on Life**
**Name :** ..... **Date:**.....

**Class : IX**
**Subject: Biology**

1. From which word is the term 'biology' derived?
  - a) Latin
  - b) Greek
  - c) Indian
  - d) Arabic
2. In which region was biology not practiced from the beginning of the civilization?
  - a) India
  - b) Egypt
  - c) America
  - d) Middle East
3. Living organisms are constituted of—
  - i. living things
  - ii. nonliving things
  - iii. both living and nonliving things
 Which one is correct?
  - a) i
  - b) ii
  - c) i and ii
  - d) i, ii and iii
4.  $\text{CO}_2 + 12\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$ . It is discussed in—
  - a) Cytology
  - b) Histology
  - c) Physiology
  - d) Morphology
5. Embryology discusses—
  - i. the origin of life
  - ii. the origin of gamete
  - iii. the development of embryo
 Which one is correct?
  - a) ii
  - b) iii
  - c) ii and iii
  - d) i, ii and iii
6. Which branch of biology discusses with the prehistoric life forms?
  - a) Cytology
  - b) Evolution
  - c) Histology
  - d) Palaeontology
7. Physical branch of biology includes—
  - i. Biogeography
  - ii. Biotechnology
  - iii. Bioinformatics
 Which one is correct?
  - a) i and ii
  - b) i and iii
  - c) ii and iii
  - d) i, ii and iii
8. Which science deals with the industry of medicine?
  - a) Pharmacy
  - b) Microbiology
  - c) Biotechnology
  - d) Medical science
9. Virus, bacteria and fungi are discussed in—
  - i. Parasitology
  - ii. Microbiology
  - iii. Medical Science
 Which one is correct?
  - a) i
  - b) ii
  - c) i and ii
  - d) i, ii and iii
10. Genetic engineering associated with—
  - i. gene
  - ii. heredity
  - iii. gene technology
 Which one is correct?
  - a) i
  - b) iii
  - c) i and iii
  - d) i, ii and iii
11. A survey report has been published that there are 200 tigers in the Sundarbans. It is the subject matter of—
  - a) Forestry
  - b) Wildlife
  - c) Biostatistics
  - d) Biogeography
12. Evolution deals with—
  - i. origin of life
  - ii. development of zygote
  - iii. gradual development of life
 Which one is correct?
  - a) i and ii
  - b) i and iii
  - c) ii and iii
  - d) i, ii and iii
13. What is not discussed in endocrinology?
  - a) Insulin
  - b) Glucose
  - c) Thyroxin
  - d) Gonadotropin
14. Entomology deals with—
  - i. birds
  - ii. mosquito
  - iii. honey bee
 Which one is correct?
  - a) ii
  - b) iii
  - c) ii and iii
  - d) i, ii and iii
15. What is not discussed in medical science?
  - a) Diseases
  - b) Medicine
  - c) Treatment
  - d) Analysis of cancer
16. Applied branch of biology includes—
  - i. Fisheries
  - ii. Agriculture
  - iii. Endocrinology
 Which one is correct?
  - a) i
  - b) ii
  - c) i and ii
  - d) i, ii and iii
17. Which one is not the subject of applied branch of biology?
  - a) Biochemistry
  - b) Biotechnology
  - c) Biogeography
  - d) Genetic Engineering
18. The aim of classification—
  - i. to classify the living world easily
  - ii. to know the living world accurately
  - iii. to describe the history the living world
 Which one is correct?









19. The membrane of a mitochondrion is composed of—  
*i.* lipid  
*ii.* protein  
*iii.* phospholipids  
 Which one is correct?  
 a) i and ii                      b) i and iii  
 c) ii and iii                     d) i, ii and iii
20. What is called the infoldings of mitochondria?  
 a) Cristae                        b) Stroma  
 c) Microvilli                    d) Plasmodesmata
21. What is called the round body studded with the cristae?  
 a) Ribosome                    b) Oxysome  
 c) Lysosome                    d) Centrosome
22. What does an oxysome contain?  
 a) Lipid                         b) Pectin  
 c) Enzyme                      d) Cellulose
23. In how many stages is aerobic respiration occurred?  
 a) 2                                b) 3  
 c) 4                                d) 5
24. In mitochondria—  
*i.* Glycolysis occurs  
*ii.* Kreb's cycle occurs  
*iii.* Acetyl-CoA formation occurs  
 Which one is correct?  
 a) i and ii                        b) i and iii  
 c) ii and iii                      d) i, ii and iii
25. In which stage of aerobic respiration is maximum energy produced?  
 a) Glycolysis  
 b) Kreb's cycle  
 c) Acetyl-CoA formation  
 d) Electron transport sytem
26. In which of the following cell is mitochondrion present? In—  
 a) Sperm                         b) Bacterium  
 c) Trichomonus                d) Monocercomonoides
27. How many types of plastids are there in plant?  
 a) 2                                b) 3  
 c) 4                                d) 5
28. Grana of plastid—  
*i.* captures solar energy  
*ii.* helps to produce carbohydrate  
*iii.* converts solar energy into chemical energy  
 Which one is correct?  
 a) i and ii                        b) i and iii  
 c) ii and iii                      d) i, ii and iii
29. What is absent in chromoplast?  
 a) Carotene                    b) Chlorophyll  
 c) Xanthophyll                d) Phycoerythrin
30. In which part of plant is leucoplast absent?  
 a) Root                          b) Leaf  
 c) Ovary                         d) Embryo
31. In which cell organelle is stroma found?  
 a) Plastid                        b) Nucleus  
 c) Golgi body                    d) Mitochondria
32. Golgi body—  
*i.* stores protein  
*ii.* plays role in metabolic activities  
*iii.* is involve in secretion of some hormones  
 Which one is correct?  
 a) iii                                b) i and iii  
 c) ii and iii                      d) i, ii and iii
33. Which cell organelle transport enzymes for other cells?  
 a) Nucleus                        b) Golgi body  
 c) Mitochondria                d) Endoplasmic reticulum
34. Which cell organelle plays role in the development of mitochondria, vacuole etc.?  
 a) Nucleus                        b) Lysosome  
 c) Golgi body                    d) Endoplasmic reticulum
35. Cell vacuole contains—  
*i.* pigment  
*ii.* inorganic salt  
*iii.* inorganic acid  
 Which one is correct?  
 a) i                                 b) ii  
 c) i and ii                        d) i, ii and iii
- Observe the following figure and answer the question nos. 36 and 37.
- 
36. Which cell organelle does the above figure indicate?  
 a) Ribosome                      b) Lysosome  
 c) Centrosome                    d) Mitochondria
37. The organelle mentioned in the above figure—  
*i.* produces enzyme  
*ii.* protects cells from germ  
*iii.* destroys other organelles due to lack of O<sub>2</sub>  
 Which one is correct?  
 a) i                                 b) ii  
 c) ii and iii                      d) i, ii and iii
38. Which one of the following is not a non-membranous organelle of a cell?  
 a) Ribosome                      b) Lysosome  
 c) Centrosome                    d) Cytoskeleton
39. Which one is not the structural component of the fibers of cytoskeleton?  
 a) Actin                          b) Myosin  
 c) Tubulin                         d) Globulin
40. Cytoskeleton—  
*i.* shapes the cell  
*ii.* holds the organelles in place  
*iii.* is located beneath the plasmalemma  
 Which one is correct?



Observe the following figure and answer the question nos. 61 and 62.

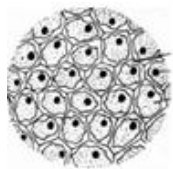


Fig: A

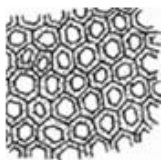


Fig: B

61. Where is Fig: A found?  
 a) Tip of root                      b) Coat of seed  
 c) Peel of fruit                      d) Vein of leaves
62. Tissue of Fig: B—  
 i. is of two types  
 ii. provides mechanical support  
 iii. composed of cell with thick wall  
 Which one is correct?  
 a) ii                                      b) iii  
 c) ii and iii                          d) i, ii and iii
63. Into how many types are the complex tissues grouped?  
 a) 2                                      b) 3  
 c) 4                                      d) 5
64. How many types of primary xylem are there?  
 a) 2                                      b) 3  
 c) 4                                      d) 5
65. Which one is not found in xylem?  
 a) Vessels                              b) Tracheids  
 c) Sieve cell                          d) Xylem fiber
66. Where is tracheids not found? In—  
 a) Fern                                  b) Moss  
 c) Angiosperm                          d) Gymnosperm
67. Xylem vessels—  
 i. short and tubular  
 ii. slender and sharp end  
 iii. walls differently thickened  
 Which one is correct?  
 a) i and ii                              b) i and iii  
 c) ii and iii                          d) i, ii and iii
68. In which plant is xylem vessel much longer?  
 a) Grass                                  b) Maize  
 c) Creeper                              d) Sugarcane
69. Where is primary type of vessel found? In—  
 a) Grass                                  b) Maize  
 c) *Gnetum*                              d) Sugarcane
70. Xylem vessel—  
 i. transports prepared food  
 ii. transports water and minerals  
 iii. provides the organs with proper rigidity  
 Which one is correct?  
 a) i and ii                              b) i and iii  
 c) ii and iii                          d) i, ii and iii
71. Which one lacks nucleus?  
 a) Sieve cell                              b) Parenchyma  
 c) Phloem fibre                          d) Companion cell
72. Companion cell is—  
 i. thick walled  
 ii. turgid with protoplasm  
 iii. parenchyma type of cell  
 Which one is correct?  
 a) i and ii                              b) i and iii  
 c) ii and iii                          d) i, ii and iii
73. What type of cell is the fiber of jute?  
 a) Parenchyma                          b) Collenchyma  
 c) Sclerenchyma                          d) Chlorenchyma
74. In which branch of biology are the different types of tissues discussed?  
 a) Genetics                              b) Cytology  
 c) Histology                              d) Embryology
75. How many types of animal tissue are there?  
 a) 2                                      b) 3  
 c) 4                                      d) 5
76. What is not the function of epithelial tissue?  
 a) Digestion of food materials  
 b) Secretion of waste products  
 c) Absorption of water and nutrients  
 d) Transcellular transport of specific materials
77. How many types of epithelial tissue are there on the basis of the size of cell, the location in the animal body and the nature of work?  
 a) 2                                      b) 3  
 c) 4                                      d) 5
78. The epithelial tissue found in kidney is—  
 i. cuboidal epithelial tissue  
 ii. columnar epithelial tissue  
 iii. squamous epithelial tissue  
 Which one is correct?  
 a) i    b) i and iii  
 c) ii and iii                          d) i, ii and iii
79. What is not the function of epithelial tissue which is found in the internal wall of intestine of vertebrates?  
 a) Secretion                              b) Digestion  
 c) Protection                              d) Absorption
80. How many types of epithelial tissue are there on the basis of the cell layers arranged on the base membrane?  
 a) 2                                      b) 3  
 c) 4                                      d) 5
81. Where is pseudo-stratified epithelial tissue found?  
 a) Kidney                                  b) Trachea  
 c) Intestine                              d) Wall of stomach
82. The wall of trachea is composed of—  
 i. simple epithelial tissue  
 ii. ciliated epithelial tissue  
 iii. pseudo-stratified epithelial tissue  
 Which one is correct?  
 a) i and ii                              b) i and iii  
 c) ii and iii                          d) i, ii and iii

83. Where is flagellated epithelial tissue found?

- a) Hydra                      b) Amoeba  
c) Spongilla                  d) Round worm

84. In connective tissue—

- i. matrix is more  
ii. cells are less in number  
iii. cells are more in number

Which one is correct?

- a) i and ii                      b) i and iii  
c) ii and iii                    d) i, ii and iii

85. How many types of connective tissue are there?

- a) 2                              b) 3  
c) 4                              d) 5

86. Where is mast cell found? In—

- a) Glandular tissue  
b) Fluid connective tissue  
c) Fibrous connective tissue  
d) Skeletal connective tissue

87. Fibrous connective tissue is found—

- i. sparsely in muscle  
ii. in the lymphatic gland  
iii. below the body-integument

Which one is correct?

- a) i and ii                      b) i and iii  
c) ii and iii                    d) i, ii and iii

88. How many types of skeletal tissue are there?

- a) 2                              b) 3  
c) 4                              d) 5

89. Where is lacunae found? In the cell of—

- a) Bone                         b) Blood  
c) Cartilage                    d) Integument

90. Cartilage is found in—

- i. nose  
ii. pinna of ear  
iii. end of femur

Which one is correct?

- a) ii                              b) iii  
c) ii and iii                    d) i, ii and iii

91. What is the color of plasma?

- a) Bluish                        b) Reddish  
c) Colorless                    d) Yellowish

92. What type of compound is haemoglobin?

- a) Iron compound              b) Zinc compound  
c) Iodine compound            d) Copper compound

93. With what does haemoglobin mix easily?

- a) H<sub>2</sub>                              b) N<sub>2</sub>  
c) O<sub>2</sub>                              d) CO<sub>2</sub>

94. Lymph is—

- i. yellowish  
ii. slightly salty  
iii. slightly alkaline

Which one is correct?

- a) i and ii                      b) i and iii  
c) ii and iii                    d) i, ii and iii

95. How many types of muscular tissue are there?

- a) 2                              b) 3  
c) 4                              d) 5

96. Muscular tissue—

- i. almost lacks matrix  
ii. originates from mesoderm  
iii. capable of contracting and expanding

Which one is correct?

- a) i and ii                      b) i and iii  
c) ii and iii                    d) i, ii and iii

Observe the following figure and answer the question nos. 97 and 98.

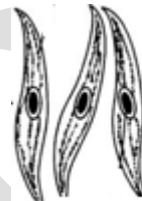


Fig: A

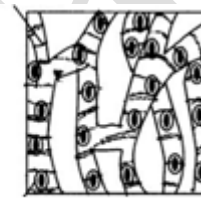


Fig: B

97. Where is tissue of Fig: A not found? In—

- a) Vein                            b) Heart  
c) Stomach                      d) Intestine

98. Fig: B in the stem—

- i. has transverse striations  
ii. intercalated discs are present  
iii. structure is similar to smooth muscle

Which one is correct?

- a) iii                              b) i and ii  
c) ii and iii                    d) i, ii and iii

99. What is absent in nerve cell?

- a) Centriole                      b) Ribosome  
c) Golgi body                    d) Mitochondria

100. Which one is not the part of digestive system?

- a) Larynx                        b) Rectum  
c) Duodenum                    d) Esophagus

**Multiple Choice Questions**  
**Chapter Three**  
**Cell Division**

**Name :** ..... **Date:** .....  
**Class : IX** **Subject: Biology**

- Which one is not a unicellular organism?  
 a) *Hydra*                      b) *E. coli*  
 c) *Amoeba*                      d) *Plasmodium*
- From what are most of the multi-cellular organisms originated?  
 a) Ovum                      b) Zygote  
 c) Sperm                      d) Gamete
- How many types of cell divisions are found in living organisms?  
 a) 2                      b) 3  
 c) 4                      d) 5
- In the process of amitosis—  
 i. nucleus becomes shorter  
 ii. nucleus becomes dumbbell shaped  
 iii. a depression forms in the middle of the cell  
 Which one is correct?  
 a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii
- What type of cell division is occurred in yeast?  
 a) Mitosis                      b) Meiosis  
 c) Amitosis                      d) Caryokinesis
- In which of the following is amitosis cell division not occurred?  
 a) Yeast                      b) *Obelia*  
 c) *Amoeba*                      d) Bacterium
- How many times does the nucleus of the mother cell divide in mitosis?  
 a) 1                      b) 2  
 c) 3                      d) 4
- How many identical daughter cells are produced through mitosis?  
 a) 2                      b) 4  
 c) 8                      d) 16
- Which one of the following is called equational division?  
 a) Meiosis                      b) Mitosis  
 c) Amitosis                      d) Cytokinesis
- Mitosis cell division occurs—  
 i. in the somatic cells of animal  
 ii. in the meristematic tissue of plant  
 iii. in asexual reproduction of lower organisms  
 Which one is correct?  
 a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii
- Where is mitosis not occurred? In—  
 a) Bud                      b) Carpel  
 c) Radicle                      d) Plumule

From the figure below, answer question nos. 12 and 13.

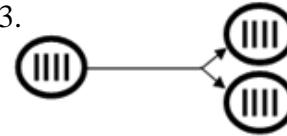


Fig: Y

- In how many phases does the process of Fig: Y take place?  
 a) 2                      b) 4  
 c) 5                      d) 6
- In the process of Fig: Y—  
 i. nucleus is divided only once  
 ii. nucleus becomes dumbbell shaped  
 iii. two identical daughter cells are produced  
 Which one is correct?  
 a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii
- Into how many stages is karyokinesis divided?  
 a) 3                      b) 4  
 c) 5                      d) 6
- At which stage of mitosis can the chromosome be seen with a compound microscope?  
 a) Prophase                      b) Anaphase  
 c) Telophase                      d) Metaphase
- Which stage of mitosis takes long time?  
 a) Prophase                      b) Anaphase  
 c) Telophase                      d) Metaphase
- In which stage of mitosis cell division the nucleus becomes bigger in size?  
 a) Prophase                      b) Metaphase  
 c) Telophase                      d) Pro-metaphase
- In which stage is each chromosome divided longitudinally into two chromatids?  
 a) Prophase                      b) Metaphase  
 c) Anaphase                      d) Pro-metaphase
- Which one of the following is a very short phase of mitosis cell division?  
 a) Prophase                      b) Metaphase  
 c) Anaphase                      d) Pro-metaphase
- In which stage of mitosis, spindle apparatus made of microtubules of cytoskeleton is formed?  
 a) Prophase                      b) Metaphase  
 c) Anaphase                      d) Pro-metaphase
- Kinetochores—  
 i. are protein structures  
 ii. assemble on centromeres  
 iii. link chromosomes with mitotic spindles

Which one is correct?

- a) iii                      b) i and iii  
c) ii and iii              d) i, ii and iii
22. In which stage of mitosis is aster ray radiated in animal cell?  
a) Prophase              b) Telophase  
c) Anaphase              d) Pro-metaphase
23. Which one radiates astral ray at prometaphase of mitosis in animal cell?  
a) Chromatic reticulum  
b) Endoplasmic reticulum  
c) Centriole of centrosome  
d) Microtubules of Cytoskeleton
24. In which stage of mitosis do the nuclear membrane and nucleolus start to disappear?  
a) Prophase              b) Telophase  
c) Anaphase              d) Pro-metaphase
25. At metaphase—

- i. chromosomes come at the equator  
ii. chromosomes look short and thick  
iii. repulsion between chromatids increases

Which one is correct?

- a) ii                      b) i and iii  
c) ii and iii              d) i, ii and iii
26. In which stage do the nuclear membrane and nucleolus disappear completely?  
a) Prophase              b) Anaphase  
c) Metaphase              d) Pro-metaphase

From the figure below, answer question nos. 27, 28 and 29.



Fig: A

27. In which stage of mitosis is 'S' formed?  
a) Prophase              b) Metaphase  
c) Anaphase              d) Pro-metaphase
28. Which stage of mitosis cell division is shown in the Fig: A?  
a) Prophase              b) Metaphase  
c) Anaphase              d) Pro-metaphase
29. In the next stage of the stage of Fig: A—  
i. chromatids become chromosomes  
ii. chromosomes look V, L, J or I shaped  
iii. chromosomes move to the respective poles  
Which one is correct?  
a) ii                      b) iii  
c) ii and iii              d) i, ii and iii
30. Which stage of mitosis cell division creates daughter chromosomes?  
a) Prophase              b) Metaphase  
c) Anaphase              d) Pro-metaphase

31. At the end of which stage of mitosis is cytokinesis started?

- a) Prophase              b) Telophase  
c) Anaphase              d) Metaphase
32. In which stage of mitosis are chromatin fibers formed?  
a) Prophase              b) Telophase  
c) Anaphase              d) Metaphase

33. In telophase—

- i. chromosomes get elongated  
ii. spindle apparatus disintegrated  
iii. nucleolus and nuclear membrane reappear

Which one is correct?

- a) i and ii                  b) i and iii  
c) ii and iii                d) i, ii and iii
34. Which stage of mitosis is a reversal of the prophase  
a) Anaphase              b) Telophase  
c) Metaphase              d) Prometaphase

35. At the end of telophase—

- i. two identical daughter cells are developed  
ii. equal distribution of cytoplasmic organelles is occurred  
iii. cell plate is formed with some small parts of endoplasmic reticulum

Which one is correct?

- a) i and ii                  b) i and iii  
c) ii and iii                d) i, ii and iii
36. How many cells does a human body have?  
a) 10 billion                b) 20 trillion  
c) 30 billion                d) 30 trillion
37. If each cell division takes one day to complete, how many days will the number of cells necessary for a human being take to create?  
a) 10-20 days              b) 20-30 days  
c) 30-40 days              d) 40-50 days

38. Through mitosis—

- i. growth in organisms takes place systematically  
ii. qualitative features of the living world remain unchanged  
iii. the balance between the nucleus and cytoplasm of a cell is maintained

Which one is correct?

- a) i                          b) iii  
c) i and iii                d) i, ii and iii
39. What is the result of mitotic errors or irregular or uncontrolled cell division?  
a) Gamete                  b) Tumour  
c) Zygote                    d) Haploid cell
40. Which two genes of papilloma virus produce a chemical substance that displaces two protein molecules which control cell division?  
a) E<sub>1</sub> and E<sub>2</sub>                b) E<sub>5</sub> and E<sub>6</sub>  
c) E<sub>6</sub> and E<sub>7</sub>                d) CysE and CysM

41. Which one of the following is called reduction division?  
 a) Meiosis                      b) Mitosis  
 c) Amitosis                      d) Cytokinesis

42. Meiosis takes place in—  
 i. growing leaves, buds, etc.  
 ii. the testes and ovary of higher animals  
 iii. the stamen and carpel of flowering plants  
 Which one is correct?

- a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii
43. How many daughter cells are produced through meiosis?  
 a) 2                                  b) 4  
 c) 8                                  d) 16

From the figure below, answer question nos. 44 and 45.

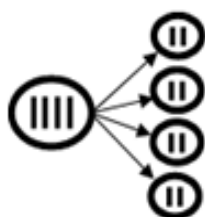


Fig: X

44. In how many successive phases is the process mentioned in Fig: X completed?  
 a) 2                                  b) 3  
 c) 4                                  d) 5

45. In the process of Fig: X—  
 i. the number of chromosomes decreases  
 ii. nucleus divides twice and chromosome once  
 iii. both the nucleus and chromosomes divide only once

Which one is correct?  
 a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii

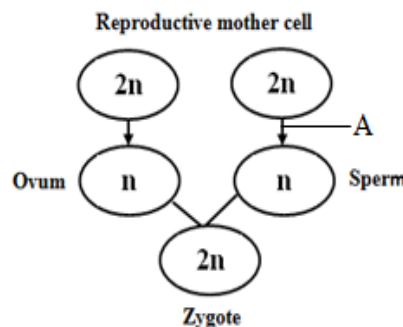
46. In which phase of cell division does the number of chromosomes in the daughter cell become half of the number of chromosomes of mother cell?  
 a) Meiosis-I                      b) Anaphse  
 c) Telophase                      d) Meiosis-II

47. Which cell division helps to retain heredity?  
 a) Mitosis                              b) Meiosis  
 c) Amitosis                              d) Mitosis and meiosis

48. Through meiosis—  
 i. exchange of genes occurs  
 ii. the features in the species stay same  
 iii. chromosome number remain constant in organism

Which one is correct?  
 a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii

From the figure below, answer question nos. 49 and 50.



49. What is the process 'A' mentioned in the stem?  
 a) Mitotic                              b) Meiotic  
 c) Amitosis                              d) Cytokinesis

50. The process mentioned in the stem—  
 i. produces diploid zygote  
 ii. produces haploid gametes  
 iii. maintains the continuity of heredity trait  
 Which one is correct?

a) i and ii                      b) i and iii  
 c) ii and iii                      d) i, ii and iii

51. Zygote is the—  
 i. features of mitosis division  
 ii. result of the union of two gametes  
 iii. state of the union of two haploid cells  
 Which one is correct?

a) i and ii                              b) i and iii  
 c) ii and iii                              d) i, ii and iii

52. Which process creates variation among the organisms of same species?  
 a) Mitosis                              b) Meiosis  
 c) Amitosis                              d) Interphase

53. In which of the following the number of chromosomes of somatic cell gets changed?  
 a) Potato                              b) Tomato  
 c) Pineapple                              d) Cucumber

54. Which one was created when the chromosome set of *Xenopus tropicalis* was doubled?  
 a) *Xenopus laevis*  
 b) *Xenopus indica*  
 c) *Xenopus equatorial*  
 d) *Xenopus falciparum*

55. The process of meiosis—  
 i. creates genetic diversity in any species  
 ii. keeps the qualitative features of living world intact  
 iii. increases the possibility of survival of organisms

Which one is correct?  
 a) i and ii                              b) i and iii  
 c) ii and iii                              d) i, ii and iii