



BIOLOGY

BOOKS - SANTRA BIOLOGY (BENGALI ENGLISH)

CELL DIVISION

**Exercise Objective Type Questions A Multiple
Choice Questions Mcq**

1. Where we can observe mitosis

A. Nail base

B. Brain

C. Legs

D. Kidney

Answer: A



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2. Crossing over occurs during

A. Leptotene

B. Pachytene

C. Diplotene

D. Diakinesis

Answer: B



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3. Meiosis is

A. Multiplication division

B. Equational division

C. Disjunctional division

D. Reductional division

Answer: D



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4. Mitotic anaphase differs from metaphase in possessing

A. Same number of chromosomes and same number of chromatids

B. Half number of chromosomes and half number of chromatids

C. Half number of chromosomes and same number of chromatids

D. Same number of chromosomes and half number of chromatids

Answer: D



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5. The term meiosis was coined by

A. Farmer and Moore

B. Flemming

C. Blackman

D. Robertson

Answer: A



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6. When does synapsis or bivalent formation occurs in meiosis

A. Diplotene

B. Pachytene

C. Zygotene

D. Leptotene

Answer: C



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7. Segregation of Mendelian factor (Bb) occurs during

A. Diplotene

B. Anaphase-I

C. Anaphase-II

D. Telophase

Answer: B



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8. Poleward movement of dyads occurs during

A. Anaphase

B. Anaphase-I

C. Anaphase-II

D. Telophase

Answer: B



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9. Haploid complement of an organism is

A. Genotype

B. Phenotype

C. Genome

D. Genetic system

Answer: C



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10. Number of chromatids at metaphase is

- A. Two each in mitosis and meiosis
- B. Two in mitosis and one in meiosis
- C. Two in mitosis and four in meiosis
- D. One in mitosis and two in meiosis

Answer: A



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11. Crossing like configuration of non sister chromatids in a bivalent come in contact during first meiotic division are

- A. Chiasmata
- B. Chromomere
- C. Centromere
- D. Bivalent

Answer: A



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12. During meiosis-I the number of chromosome is

A. Doubled

B. Tripled

C. Halved

D. Quadrupled

Answer: C



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13. Meiotic division occurring just at the time of gametogenesis

A. Sporic

B. Initial

C. Intermediate

D. Terminal

Answer: C



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14. Balbiani rings (puffs) are sites of

A. DNA replication

B. RNA and protein synthesis

C. Synthesis of polysaccharides

D. Synthesis of lipid

Answer: B



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15. Cell lineage "All cells are derived from pre-existing cell" is the greatest generalisation of

A. Virshow

B. Schleiden

C. Schwann

D. Lamarck

Answer: B



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16. Name the stage of mitosis in which chromosomes are arranged on the equator of spindle

A. Anaphase

B. Metaphase

C. Prophae

D. Telophase

Answer: B



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17. Meiosis is evolutionary significant because it result in

- A. Genetically same daughter cells
- B. Four daughter cells
- C. Egg and sperm
- D. Recombination

Answer: D



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18. Diploid chromosome number being 8, what will be the number of chromatids in each daughter after meiosis-II

A. 16

B. 8

C. 4

D. 2

Answer: D



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19. Meiosis was discovered by

A. Strasburger.

B. Hofmeister

C. Sutton

D. Amici

Answer: B



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20. Best stage to observe shape, size and number of chromosome is

A. Interphase

B. Metaphase

C. Prophase

D. Telophase

Answer: B



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21. Zygotic meiosis occurs in

A. Pinus

B. Marchantia

C. Chlamydomonas

D. Dryopteris

Answer: C



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22. Phragmoplast is the precursor of

A. Leucoplat

B. Chloroplast

C. Chromoplast

D. Cell plate

Answer: D



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23. Pachytene belong to

A. Mitosis with two asters.

B. Meiosis

C. Growth of cell

D. Development of endosperm

Answer: B



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24. Plant cell lack

A. centriole

B. Asters

C. Spindle fibres

D. Both 'a' and 'b'

Answer: D



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25. In mitosis chromosome duplication occurs during

A. Interphase

B. Early prophase

C. Late prophase

D. Late telophase

Answer: A



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26. Centriole replicates during

A. Interphase

B. Early prophase

C. Late prophase

D. Late telophase

Answer: B



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27. Karyokinesis differs from cytokinesis as it involves division of

A. Cytoplasm

B. Nucleus

C. Both nucleus and cytoplasm

D. Cell plate

Answer: B



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28. Metaphase chromosome with medial centromere is

A. Telocentric

B. Acrocentric

C. Metacentric

D. Submetacentric

Answer: C



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29. Condensation of chromosome with visible centromere occurs during

A. G_1 phase

B. G_2 phase

C. S-phase

D. M-phase

Answer: D



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30. Four daughter cells formed during meiosis differ from each other due to

A. Number of chromosomes

B. Crossing over

C. Independent assortment of chromosome

D. Both 'b' and 'c'

Answer: D



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31. Meiosis occurs in tomato in

A. Pollen sac and ovule

B. Microspore and megaspore mother cell

C. Both 'a' and 'b'

D. Zygote

Answer: C



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32. DNA synthesis occurs during

A. Interphase

B. Prophase

C. Metaphase

D. Anaphase

Answer: A



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33. Chromatids/Chromosomes are clearly visible in

A. Zygotene

B. Diplotene

C. Pachytene

D. Diakinesis

Answer: C



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34. Nuclear spindle has how many types of fibres?

A. one

B. Two in mitosis and one in meiosis

C. Three

D. Four

Answer: C



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35. Number of chromosomal groups at equatorial plate of metaphase -I of a plant body having $2n=50$, chromosomes shall be

A. 25

B. 50

C. 100

D. 75

Answer: B



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36. Point at which polytene chromosome appear to be attached is

A. Centriole

B. Chromocentre

C. Chromomere

D. Centromere

Answer: D



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37. Each chromosome at anaphase stage of bone marrow cells in our body has

A. One chromatid

B. Two chromatids

C. Several chromatid

D. No chromatid

Answer: B



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38. Mitosis is absent in

A. Zygotene

B. Germinal cell

C. Bone cell

D. None of these

Answer: A::B



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39. Chiasmata is first seen in

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

Answer: D



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40. Which of the phase of mitosis is the longest?

- A. Prophase
- B. Metaphase
- C. Anaphase
- D. Telophase

Answer: A



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41. Which one is present on chromosome?

- A. Centromere
- B. Centrosome
- C. Nucleus
- D. Golgi body

Answer: A



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42. In meiotic metaphase, no. of chromosome is

A. One chromatids

B. Two

C. Three

D. Four

Answer: D



43. In which the number of chromosomes is halves?

A. Mitosis with two asters.

B. Amitosis

C. Meiosis

D. Fertilization

Answer: C



44. Meiosis is situated in

A. Microsporangium

B. Pollen grain

C. Gamete

D. All of these

Answer: C



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45. Number of mitotic divisions required to produce 128 cells from a single cell is

A. 7

B. 14

C. 1

D. 32

Answer: A



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46. in which stage the chromosome appear thin and long thread like structure?

A. Zygotene

B. Leptotene

C. Pachytene

D. Prophase

Answer: B



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47. During cell cycle, RNA and protein are synthesised in

A. S-phase.

B. G_1 phase

C. G_2 phase

D. Both 'b' and 'c'

Answer: 4



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48. Crossing over results in

A. Segregation of allele

B. Dominance of allele

C. Recombination

D. Linkage between genes

Answer: C



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49. Chromosomes of higher plants are made of

A. DNA + histone

B. DNA only

C. RNA + DNA

D. DNA + pectins

Answer: A



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50. Longitudinal duality of each chromosome of a homologous pair becomes clear, showing four chromatids of each bivalent at

A. Diplotene

B. Pachytene

C. Zygotene

D. Diakinesis

Answer: A



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51. During cell division, the spindle fibres attaches to

- A. Chromatid
- B. Chromosomes
- C. Kinetochore
- D. All of these

Answer: C



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52. G_1 , S and G_2 are phases noticeable in

A. Prophase

B. Metaphase

C. Anaphase

D. Interphase

Answer: D



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53. Cell division is initiated in plants by

A. Cytokinin

B. Auxin

C. Gibberellin

D. Abscisic acid

Answer: A



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54. Zygotic meiosis can be traced in

A. Funaria

B. Dryopteris

C. Puccinia

D. Chlamydomonas

Answer: D



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55. Chromosomes connected with sex determination are

- A. Autosomes
- B. Heterosomes
- C. Oxysomes
- D. B-chromosomes

Answer: B



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56. Monosomics are

A. Nondisjunction

B. $2n + 1$

C. $2n - 2$

D. $2n - 1$

Answer: D



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57. Which one can induce polyploidy

A. Colchicine

B. Acridines

C. Ethylene

D. Maleic Hydrazide

Answer: A



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58. Aneuploidy in zygotic chromosome number

A. Thrice of gametic number

B. Twice of gametic number

C. Quadruple of gametic number

D. Abnormal

Answer: B



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59. Smallest segment of genetic material affected by mutation is

A. Recon

B. Cistron

C. Muton

D. Exon

Answer: C



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60. During gamete formation, the enzyme recombinase participates during

A. Prophase - II

B. Anaphase - II

C. Metaphase - I

D. Prophase - I

Answer: D



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61. The chromosome with centromere near the end is called

A. acrocentric

B. metacentric

C. sub-metacentric

D. telocentric

Answer: A



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62. Proteins helping in kinetocore formation of yeast are

A. CBF2 and Kar^3P

B. CBF2 and CBF3

C. CBF3 and Kar^3P

D. CBF2, CBF3 and Kar^3P

Answer: D



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63. The frequency of crossing over occurs between two genes located on the same chromosome depends on

- A. length of the chromosome
- B. position of the centromere
- C. activities of two genes
- D. distance between two genes

Answer: D



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64. The association of histone H1 with a nucleosome indicates

A. DNA replication is occurring

B. The DNA is condensed into a chromatin fibre

C. The DNA double helix is exposed

D. Transcription is occurring.

Answer: B



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B Choose More Than One Options

1. Mitosis cell division occur in

A. Stem tip

B. Intercalary meristem

C. Ovar

D. Testis

Answer: A::B



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2. Anaphasic chromosomes appear

A. V shaped

B. T shaped

C. J shaped

D. L shaped

Answer: A::C::D



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3. In pachytene stage of meiosis

A. Binding of homologous chromosome

B. Formation of four chromatid

C. Formation of chiasma

D. Crossing over occurred in non-sister chromatid

Answer: B::C::D



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4. Mitosis consists of two steps which are

A. S phase

B. Karyokinesis

C. Cytokinesis

D. G_1 phase

Answer: B::C



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5. Meiosis occur in

A. Anther

B. Testes

C. Meristematic tissue

D. Ovary

Answer: B::D



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6. G_1 phase of cell cycle occurred

A. RNA synthesis

B. DNA synthesis

C. Metabolism

D. Protein synthesis

Answer: A::C::D



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7. The most lengthy phase of ideal cell cycle are

A. G - phase

B. S - phase

C. Prophase

D. Metaphase

Answer: A



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8. Which phases are included in interphase?

A. S phase

B. G_2 phase

C. Cytokinesis

D. G_1 phase

Answer: A::B::D



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C Fill In The Blanks

1. The property of invasion of cancer is called

_____ .



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2. Synaptonemal complex during _____ stage of meiosis.



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3. Crossing over occurs during _____.



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4. Nucleolus disappears during _____.



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5. During meiosis at leptotene the homologous chromosomes takes _____ configuration.



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6. The type of nuclear division that does not involve formation of distinct chromosomes and the formation of spindle is called _____ .





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7. The _____ is the morphological equivalent of genetic crossing over.



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8. Sister chromatids that form daughter chromosomes in anaphase of mitosis are joined together at the _____.



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9. A cell ready to undergo meiosis is called _____.



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10. Crossing over occurs in _____ stage of prophase - I of _____.



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11. _____ occurs during the formation of gametes.



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12. At _____ stage of meiosis, homologous chromosomes start pairing.



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13. Cell division that occurs without the formation of spindle is called _____.



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14. Metaphase plate is formed by _____.



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15. _____ is the failure of the two sister chromatids to separate in mitosis.



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16. The alkaloid colchicine, helpful in arresting nuclear division at metaphase and bringing polyploidy is obtained from plant _____.



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17. Mitosis results in formation of two identical daughter cells having same number of chromosomes, hence it is called _____.





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18. The genes responsible for producing cancer are known as _____.



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19. The pairing of homologous chromosome during prophase - I of meiosis is known as _____.



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20. DNA replication occurs at _____ of interphase.



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D True Or False Statement Questions

1. The cell cycle may be arrested at G_2 .



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2. Meiosis in man occurs in the gamete.



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3. Crossing over occurs at pachytene substage.



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4. Meiosis occurs in the testis of guineapig.



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5. Cancer cell does not divide.



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6. Interphase is the stage between prophase - I and metaphase - I.



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7. Mitosis may also be called as reductional division.



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8. Mitosis takes place in meiocytes.



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9. At metaphase there is division and separation of the centrosome and contraction of spindle fibre.



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10. Chlochicine is employed for bringing haploidy.



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11. Meiosis result in the formation of four haploid cells.



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12. At anaphase - I the two chromatid of each chromosome are called dyads.



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13. Centriole and centromere are identical structure.



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Very Short Answer Type Questions

1. What is karyokinesis?



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2. What is cytokinesis?



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3. Name the phase in which the chromatin more apart in mitosis and meiosis.



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4. Name the phase of cell division in which the centromere link up at the equator of the spindle.



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5. By which method cytokinesis occur in animal cell?



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6. Name the method by which cytokinesis takes place in a plant cell.



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7. Which organism have intranuclear mitosis?



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8. Give an example of anastral type of mitosis.



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9. What is amphiastral mitosis?



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10. What is polytene?



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11. Give one alternative term for meiosis.



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12. Name the phases of cell cycle.



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13. In which phase of interphase DNA replication occurs ?



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14. Name the three types of cell division.



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15. Who first described mitosis?



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16. What is endomitosis?



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17. What are the spindle fibre and astral rays composed of?



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Short Answer Type Questions

1. What is endomitosis?



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2. How cell division occurs with respect to energy?



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3. What is syndetic knot ?



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4. Which phase correspond Mendel's law of segregation ?



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5. What are mitogenes ?





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6. Who reported synapsis and synaptonemal complex?



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7. What is kinetochore?



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8. What do you mean by tetrad?



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9. What is karyotype?



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10. Write a brief note on zygotic meiosis.



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11. What is terminalization?



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12. Why meiosis is known as reductional division or heterotypic division?



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13. What are neoplastic cell?



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14. What are polyploid cells?



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15. What is anastral and amphiastral mitosis?



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16. What is mitotic apparatus?



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17. What do you mean by homotypic and heterotypic division?



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18. What is endomitosis?



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19. State the difference between Amitosis and Endomitosis.



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20. State the differences between Amitosis and Mitosis.



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21. What is homologous chromosome?



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22. What is bouquet stage?



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23. What is synapsis ?



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24. What is bivalent or dyad?



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25. What is sister and non-sister chromatid?



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26. What is chiasma?



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27. What is reciprocal chiasma?



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28. What is non-reciprocal chiasma?



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29. What in crossing over?



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30. What is recombination?



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31. What is metakinesis ?



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32. What is interkinesis ?



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33. At which stage of cell division, nucleus disappears and when it again reappears?



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34. At which stage of cell division a chromosome becomes associated with two chromatids and at which stage they get separated ?



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35. Where and when meiosis occurs?



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36. Why do the cells divide?



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37. Why mitosis is called indirect division?



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38. What is the significance of chromosomes in the cell?



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39. What is the difference between primary constriction and secondary constriction?



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40. What are the different steps of cell cycle?

What is G_0 stage? Where is it located in the cell cycle ?



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41. What are haploid, diploid and triploid states of chromosome?



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42. Describe the chemical structure of chromosome.



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43. Describe the characteristics of viral chromosome and bacterial chromosome.



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44. What are the differences between prokaryotic and eukaryotic chromosomes.



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45. Mention the three important characteristics of meiosis cell division.



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46. Why meiosis is considered as reductional division?



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47. Give three importance of cell division.



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48. State about the importance of chromosome.



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49. Give the differences between autosome and sex chromosome.



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50. State the differences between centromere and chromomere.



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51. According to 'Finch and Klug', state the solenoid model of nucleosome.



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52. What are the differences between euchromatin and heterochromatin.



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Long Answer Type Questions

1. Give a brief account of somatic cell division with the help of labelled sketches.



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2. Describe the process of meiosis. What is its significance in sexually reproducing organism .



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3. State the basis differences between mitosis and meiosis.



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4. What do you understand by cell cycle ?

Describe all those events that occur during interphase of cell cycle that prepare the cell for nuclear division.



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5. Anaphase -1 of meiosis differs from anaphase of mitosis in one essential respect.

Describe differences and explain how it affects the daughter cells .



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6. In sexually reproducing organism the species specific chromosome number is maintained constantly irrespective of the fusion of gametes from two different sources- Explain.



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7. Compare the prophase of mitosis & meiosis giving suitable diagrams.



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8. What is cell division? Describe the importance of cell division.



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9. Describe the morphology at chromosome along with its diagram.



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10. Briefly describe the cytokinesis in plant and animal cell.



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11. State the differences between mitosis and meiosis in respect to metaphase, anaphase and telephase stage.



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12. Describe about the different types of meiosis.



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1. What is the average cell cycle span for a mammalian cell ?



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2. Distinguish cytokinesis from karyokinesis.



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3. Describe the events taking place during interphase .



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4. What is G_0 (quiescent phase) of cell cycle ?



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5. Why is mitosis called equational division ?



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6. Name the stage of cell cycle at which one of the following events occur.

(i) Chromosomes are moved to spindle equator.

(ii) Centromere splits and chromatids separate.

(iii) Pairing between homologous chromosomes takes place.

(iv) Crossing over between homologous chromosomes takes place .



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7. Describe the following :

(a) synapsis (b) bivalent (c) chiasmata



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8. How does cytokinesis in plant cell differ from that in animal cells ?



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9. Find examples where the four daughter cells from meiosis are equal in size and where they are found unequal in size.



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10. Distinguish anaphase of mitosis from anaphase 1 of meiosis.



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11. List the main differences between mitosis and meiosis .



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12. What is the significance of meiosis ?



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13. Discuss with your teacher about

(i) haploid insects and lower plants where cell -

division occurs, and

(ii) some haploid cells in higher plants where cell - division does not occur .



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14. Can there be mitosis without DNA replication in 'S' phase ?



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15. Can there be DNA replication without cell division ?



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16. Analyse the events during every stage of cell cycle and notice how the following two parameters change ?

(i) number of chromosomes (N) per cell (ii) amount of DNA content (C) per cell



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