



BIOLOGY

BOOKS - CENGAGE BIOLOGY (ENGLISH)

CELL CYCLE AND CELL DIVISION

Exercises Chose The Correct Option

1. The cell cycle of somatic cell usually consists of

A. The first part of interphase is called as G_1 phase. During this phase, there is ,maximum increase in cell size and there is acitve synthesis

of RNA and proteins.

B. In Synthetic phase (S-phase), DNA molecule of each chromosomes replicates by the synthesis of new DNA molecule.

C. During G_2 -phase, a cell contains double the amount ($4n$) of DNA present in the original diploid cell ($2n$).

D. The cell cycle consists of a short interphase and long M-phase.

Answer: D



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2. Which phase of interphase is the most important point in regulation of the cell cycle, during which it must decide whether the cell will start a new cycle or will enter in G_0 phase ?

A. S-phase

B. G_1 -phase

C. G_2 -phase

D. interphase

Answer: B



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3. Synthesis of histone proteins occurs in

- A. G_1 -phase
- B. G_2 -phase
- C. S-phase
- D. Prophase

Answer: C



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4. The correct sequence of phases of cell cycle is

- A. S, M, G_1 and G_2
- B. G_1 , G_2 , S and M
- C. M, G_1 , G_2 and S

D. G_1 , S and M

Answer: D



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5. During cell cycle, DNA replicates

A. Once

B. Twice

C. Many times

D. Not at all

Answer: A



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6. The synthesis of spindle proteins called as tubulin occurs during

A. G_1 -phase

B. S-phase

C. G_2 -phase

D. M-phase

Answer: C



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7. If mitotic division is restricted in G_1 phase of cell, the condition is known as

A. G_2 -phase

B. S-phase

C. G_0 -phase

D. M-phase

Answer: C

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8. Condensation of chromosome with visible centromere occurs during

- A. G_1 -phase
- B. S-phase
- C. G_2 -phase
- D. M-phase

Answer: D

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9. Name the stage where differentiation of the cells occur.

- A. G_0
- B. G_1
- C. G_2

D. S

Answer: A



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10. Phase of cell cycle when DNA polymerase is active

A. G_1

B. S

C. G_2

D. M

Answer: B



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11. G_0 state of cell denotes

- (a) Exit of cell denotes
- (b) Check point before entering the next phase
- (c) Death of cell
- (d) Temporary pause

A. Exit of cell denotes

B. Check point before entering the next phase

C. Death of cell

D. Temporary pause

Answer: A



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12. During cell cycle, two molecules of DNA are present in chromosome during

A. G_1 -phase

B. Beginning of S-phase

C. G_2 -phase

D. End of M-phase

Answer: C



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13. Antephase is the phase in which ATP is synthesised during cell division. It refers to

A. G_0 -phase

B. G_1 -phase

C. S-phase

D. G_2 -phase

Answer: B

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14. Which of the following materials you will select to study mitosis ?

- A. Anthers
- B. Onion root tips
- C. Flower bud
- D. Pollen

Answer: B

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15. Mitosis in animal cell is

- (a) Anastral
- (b) Amphiastral
- (c) Pre-mitosis, acetric
- (d) Eumitosis, acetric

A. Anastral

B. Amphiastral

C. Pre-mitosis,acetric

D. Eumitosis acetric

Answer: B



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16. Anastral mitosis is found in

(a) Lower animals

(b) Higher animals

(c) All plants

(d) All living organisms

A. Lower animals

B. Higher animals

C. All plants

D. All living organisms

Answer: D



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17. What is the proper sequence in mitosis ?

- A. Metaphase,telophase,prophase, and anaphase
- B. Prophase, metaphase,anaphase,and telophase
- C. Anaphase,metaphase, teophase,and prophase
- D. Telophase,anaphase,metaphase,and prophase

Answer: B



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18. The chromosome morphology is best studied during

A. Prophase

B. Metaphase, as the chromosomes are most condensed

C. Anaphase, as the chromosomes are most condensed

D. Telophase

Answer: B



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19. The two cells formed during mitosis contain

A. The same amount of DNA but a set of chromosomes different from those of parental cells.

B. The same amount of DNA and the same set of chromosomes as those of the parent cell.

C. Half the amount of DNA and the same set of chromosomes as those of the parent cell.

D. Double the amount of DNA and a set of chromosomes different from those of the parent cell.

Answer: B



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20. Colchicine is a mitotic poison because it

- A. Causes splitting up of chromosomes
- B. Inhibits the formation of mitotic spindle
- C. Stops the replication of chromosomes
- D. Agglutinates the chromosomes

Answer: B



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21. Higher plants differ from animals in having

- A. Spindle microtubule
- B. Anastral mitosis
- C. Kinetochores
- D. Disappearance of nucleous during prophase

Answer: B



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22. In which phase of mitosis are the chromosomes moving toward the poles ?

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

Answer: C



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23. The region of the attachment of chromosome to spindle fibers is called

- A. Centromere
- B. Centriole
- C. Chromonemata
- D. Centrosome

Answer: A



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24. Which of the following phases are longest and shortest in mitosis ?

A. Metaphase,anaphase

B. Prophase,anaphase

C. Telophase,anaphase

D. Prophase,telophase

Answer: B



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25. Nuclear envelope disappears at

A. Metaphase

B. Anaphase

C. Early prophase

D. Late prophase

Answer: D



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26. When nuclear division takes place without cytoplasmic division, it results in the formation of

- A. Polyteny
- B. Syncytium
- C. Polyploidy
- D. Amitosis

Answer: C



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27. Cell would normally proceed to mitosis without interruption

- A. When it has entered S-phase
- B. Once it has entered G_2 -phase
- C. At any time during coil activity

D. Irrespective of any phase

Answer: A



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28. The term meiosis was coined by

A. Flemming

B. Farmer and Moore

C. Stasburger

D. Hofmeister

Answer: B



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29. Meiosis has evolutionary significance because it results in

- A. Recombinations
- B. Eggs and sperms
- C. Four daughter cells
- D. Genetically similar daughter cells

Answer: A

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- 30.** All are the essential stages that take place during meiosis, except
- A. Two successive divisions without any DNA replication occurring between them
 - B. Formation of chiasmata and crossing over
 - C. Segregation of homologous chromosomes
 - D. Number of chromosomes in daughter cells after meiosis-II is reduced to half, but the amount of DNA remains the same

Answer: D

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31. The sequence of substages of prophase I are

- A. Zygotene, leptotene, pachytene, diakinesis, and diplotene
- B. Leptotene, zygotene, pachytene, diplotene and diakinesis
- C. Leptotene, zygotene, pachytene, diakinesis and diplotene
- D. Leptotene, pachytene, zygotene, diakinesis and diplotene

Answer: B

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32. Intimate pairing between the two members of each homologous chromosome pair is initiated by the process called as synapsis, leading to bivalent formation, occurs in

A. Zygotene

B. Pachytene

C. Diplotene

D. Diakinesis

Answer: A



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33. Mitosis differs from meiosis in not having

A. Duplication of DNA

B. Long prophase

C. Interphase

D. Synapsis and crossing over

Answer: D



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34. The recombination nodules which mediate for chromosome recombination appear at intervals on the synaptonemal complex during

- A. Zygotene
- B. Diplotene
- C. Diakinesis
- D. Pachytene

Answer: D



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35. Crossing over occurs during

- (a) Pachytene
- (b) Diplotene
- (c) Diakinesis
- (d) Zygotene

A. Pachytene

B. Diplotene

C. Diakinesis

D. Zygotene

Answer: A



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36. In oocytes, which of the following phase can last for months or years, since it is at this stage the chromosomes decondense and engage in RNA synthesis?

(a) Diakinesis

(b) Diplotene

(c) Pachytene

(d) Leptotene

A. Diakinesis

B. Diplotene

C. Pachytene

D. Leptotene

Answer: B



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37. Nuclear membrane and nucleoli are distinctly seen in

(a) Prophase

(b) Metaphase

(c) Anaphase

(d) Interphase

A. Prophase

B. Metaphase

C. Anaphase

D. Interphase

Answer: D



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38. In the meiotic cell division, 56 daughter cells are produced by two successive divisions in which

- A. First division is equational, second is reductional
- B. First division is reductional, second is equational
- C. Both divisions are reductional
- D. Both divisions are equational

Answer: B



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39. Number of chromosomes in the primary oocyte is

- A. Same as that of secondary oocyte
- B. Half as that of secondary oocyte
- C. Double as that of secondary oocyte
- D. Same as that of ovum

Answer: C

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40. Terminalization is related to

- A. Diakinesis
- B. Meiosis
- C. Mitosis
- D. Diplotene

Answer: A

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41. Meiosis involves :

- A. One nuclear division and one chromosome division
- B. Two nuclear divisions and one chromosome division
- C. One nuclear division and two chromosome divisions
- D. Two nuclear divisions and two chromosome divisions

Answer: B



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42. In meiosis, the daughter cells differ from parent cell as well as amongst themselves due to

- A. Segregation and crossing over
- B. Independent assortment and crossing over
- C. Independent assortment, segregation and crossing over

D. Segregation and independent assortment

Answer: B



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43. The movement of homologous chromosomes toward the opposite poles occur by the contraction of spindle fibres during

- (a) Anaphase
- (b) Anaphase-I
- (c) Anaphase-II
- (d) Metaphase

- A. Anaphase
- B. Anaphase-I
- C. Anaphase-II
- D. Metaphase

Answer: C



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44. In plant cells, cytokinesis occurs by

- A. Cell plate formation
- B. Invagination
- C. Cleavage
- D. Furrowing

Answer: A



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45. If egg of an organism has 10 pg of DNA in its nucleus. How many DNA would a diploid cell of same organism have in G_2 phase of meiosis ?

- A. 10 Pg
- B. 5 Pg

C. 20 Pg

D. 40 Pg

Answer: D



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46. How many meiotic divisions are essential in formation of 100 seeds in Cyperaceae family :-

A. 400

B. 125

C. 200

D. 25

Answer: C



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47. Amitosis is

- A. Division involving forming of chromosome bridges
- B. Division involving spindle formation
- C. Division in which the chromosomes are unequally distributed
- D. Cleavage of nucleus without recognizable chromosome distribution

Answer: D



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48. An interconnecting membranous network of the cell composed of vesicles, flattened sacs and tubules is

" " Or

Nuclear membrane is formed around the groups of daughter chromosomes during the telophase by

- A. Endoplasmic reticulum

B. Golgi apparatus

C. Lysosomes

D. Microbodies

Answer: A



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49. How many generations are required by a cell of meristem to produce 256 cells ?

(a) 255

(b) 64

(c) 128

(d) 8

A. 255

B. 64

C. 128

D. 8

Answer: D



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50. To produce 102 pollen grains, how many meiotic divisions are required ?

A. 25

B. 25.5

C. 26

D. 27

Answer: C



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51. Mitosis occurs in

- A. Haploid and individuals
- B. Diploid individuals
- C. Both (1) and (2)
- D. In bacteria only

Answer: C



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52. The number of DNA in chromosomes in G₂ state of cell cycle is

- A. One
- B. Two
- C. Four
- D. Eight

Answer: B



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53. Which is correct for meiotic metaphase-I ?

- A. Bivalents are arranged at equator.
- B. Univalents are arranged at equator.
- C. Non-homologous chromosomes form pair.
- D. Spindle fibres are attached at chromomere.

Answer: A



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54. In which stage of meiosis, the chromosome number reduces to half ?

- (a) Anaphase-I
- (b) Anaphase-II

(c) Telophase-I

(d) Telophase-II

A. Anaphase-I

B. Anaphase-II

C. Telophase-I

D. Telophase-II

Answer: C



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55. Chiasmata are formed as a result of

(a) Exchange of pairs of paired homologous chromosomes

(b) Exchange of part of unpaired non-homologous chromosomes

(c) Duplication of parts of pairs of paired homologous chromosomes

(d) Loss of parts of unpaired non-homologous chromosomes

A. Exchange of pairs of paired homologous chromosomes

- B. Exchange of part of unpaired non-homologous chromosomes
- C. Duplication of parts of pairs of paired homologous chromosomes
- D. Loss of parts of unpaired non-homologous chromosomes

Answer: A



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56. If $n=16$ in plant cell, then how many bivalents in metaphase-I of meiosis are possible ?

- (a) 32 bivalents
- (b) 16 tetravalents
- (c) 16 bivalents
- (d) 32 bivalents

A. 32 bivalents

B. 16 tetravalents

C. 16 bivalents

D. 32 bivalents

Answer: C



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57. G_2 phase occurs between

- A. Satellite
- B. Chromonema
- C. S & D phase
- D. G1 & M phase

Answer: D



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58. Crossing over takes place between :

- (a) Two sister chromatids
- (b) Two non-sister chromatids
- (c) Three homologous chromosomes
- (d) Four non-homologous chromosomes

- A. Two sister chromatids
- B. Two non-sister chromatids
- C. Three homologous chromosomes
- D. Four non-homologous chromosomes

Answer: B



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59. What is the significance of meiosis?'

- A. Maintaining constancy in the number of chromosomes in an organism
- B. Production of genetic variability in the population of species
- C. Reduction of diploid number of chromosomes to haploid
- D. All of the above

Answer: D



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60. Pairing of homologous chromosomes takes place in

- A. Pachytene
- B. Zygotene
- C. Diplotene
- D. None of these

Answer: B



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61. How many meiotic divisions are required to produce 200 pollen grains ?

- (a) 40
- (b) 50
- (c) 100
- (d) 200

A. 100

B. 99

C. 50

D. 200

Answer: C



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62. Which is the character of mitosis ?

A. Leptotene

B. Zygotene

C. Pachytene

D. None of the above

Answer: D



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63. Repulsion of homologous chromosomes takes place in

A. Zygotene

B. Leptotene

C. Diakinesis

D. Pachytene

Answer: C



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64. Synthesis of DNA takes place in

(a) G_2

(b) G_1

(c) S

(d) None of these

A. G_2

B. G_1

C. S

D. None of these

Answer: C



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65. Four daughter cells formed after meiosis are

- (a) Genetically similar
- (b) Genetically different
- (c) Anucleate
- (d) Mutinucleate

A. Genetically similar

B. Genetically different

C. Anucleate

D. Mutinucleate

Answer: B



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66. During meiosis, the division of centromere takes place in

A. First prophase

- B. First anaphase
- C. Second metaphase
- D. Second anaphase

Answer: D



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67. Bulk of histone proteins are synthesized in

- A. G_1 phase
- B. G_2 phase
- C. S phase
- D. G_0 phase

Answer: C



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68. Longest phase of meiosis is

- A. Metaphse I
- B. Prophase I
- C. Anaphase I
- D. Telophase I

Answer: B



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69. Colchicine prevents the mitosis of cell at

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

Answer: D



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70. The number of DNA in chromosomes in G₂ state of cell cycle is

- A. One
- B. Two
- C. Four
- D. Eight

Answer: B



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71. In meiosis, synapsis occurs during

- A. Zygotene

B. Diplotene

C. Pachytene

D. Leptotene

Answer: A



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72. Significance of meiosis in

- (a) Reduction of chromosome number to one half
- (b) Maintaining constancy of chromosome number during sexual reproduction
- (c) Production of genetic variability
- (d) All of above

A. Reduction of chromosome number to one half

B. Maintaining constancy of chromosome number during sexual reproduction

C. Production of genetic variability

D. All of above

Answer: D



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73. Chromosomes can be seen best during

(a) Prophase stage

(b) Metaphase

(c) Anaphase I

(d) Telophase I

A. Prophase stage

B. Metaphase

C. Anaphase I

D. Telophase I

Answer: B



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74. What will be the gametic chromosome number of a cell, if somatic cell have 40 chromosome?

(a) 10

(b) 20

(c) 30

(d) 40

A. 10

B. 20

C. 30

D. 40

Answer: B



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75. In which of the following stages, chromosomes are arranged at equatorial plate?

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

Answer: B



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76. During meiosis homologous chromosomes separate at which stage?

- A. Changed
- B. No change
- C. May be changed if cell is mature
- D. May be changed if cell is immature

Answer: B



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77. In meiosis chromosome number becomes

- A. Half of its parent chromosome
- B. Same as that of parent chromosome
- C. One-fourth of its parent chromosome
- D. None of the above

Answer: A



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78. Which one of the following precedes re-formation of the nuclear envelope during M phase of the cell cycle.

- A. Transcription from chromosomes and reassembly of the nuclear lamina
- B. Formation of the contractile ring and formation of the phragmoplast
- C. Formation of the contractile ring and transcription from chromosome
- D. Decondensation from chromosomes and reassembly of the nuclear lamina

Answer: D



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79. Crossing over that results in genetic recombination in higher organisms occurs between:

- A. Non-sister chromatids of a bivalent

- B. Two daughter nuclei
- C. Two different bivalents
- D. Sister chromatids of a bivalent

Answer: A



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80. In the somatic cell cycle

- A. DNA replication takes place in S-phase
- B. A short interphase is followed by a long mitotic phase
- C. G_2 phase follows mitotic phase
- D. In G_1 phase, DNA content is double the amount of DNA present in the original cell

Answer: A



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81. When synapsis is complete all along the chromosome, the cells are said to have entered a stage of prophase I, where exchange of genetic material takes place between homologous chromosomes. The stage is called

- A. Zygotene
- B. Pachytene
- C. Diplotene
- D. Diakinesis

Answer: B



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82. Many cells function properly and divide mitotically even though they do not have

A. Plasma membrane

B. Cytoskeleton

C. Mitochondria

D. Plastids

Answer: D



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83. In which stage of the cell cycle are histone proteins synthesised in a eukaryotic cells ?

A. During telophase

B. During S phase

C. During G_2 stage of prophase

D. During entire prophase

Answer: B

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84. [A] : Crossing over takes place during pachytene stage .

[R] : It is a process of inter change of chromatin material between one sister chromatid of each homologous chromosome .

- A. Zygotene
- B. Pachytene
- C. Diplotene
- D. Diakinesis

Answer: B

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85. Which type of chromosome will appear 'L'-shaped during anaphase?

- A. Telocentric

B. Acrocentric

C. Metacentric

D. Submetacentric

Answer: D



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86. A contractile mid body forms during cytokinesis in :-

A. Animals

B. Higher plants

C. Fungi

D. Algae

Answer: A



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87. Which chromosome may be lost during cell division:

- A. Giant chromosome
- B. Acentric chromosome
- C. Polycentric chromosome
- D. Telocentric chromosome

Answer: B



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88. In which order, cytokinesis occurs in plants :-

- A. Centripetal
- B. Centrifugal
- C. Oblique
- D. Equatorial

Answer: B



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89. Meiosis does not occur in

- A. Ovule
- B. Anther
- C. Microsporangia
- D. Shoot tip

Answer: D



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90. Which of the two events restore the normal number of chromosomes in life cycle?

- A. Mitosis and Meiosis
- B. Meiosis and fertilisation
- C. Fertilisation and mitosis
- D. Only meiosis

Answer: B

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91. Division of nucleus is indirect in

- A. Mitosis and Meiosis
- B. Meiosis and fertilisation
- C. Amitosis
- D. Both (1) and (2)

Answer: A

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92. Number of meiosis required to produce 100 megaspore in angiosperms is

A. 125

B. 100

C. 25

D. 75

Answer: B



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93. Constancy of the chromosome number in sexually producing generation is brought by the process of

A. Meiosis

B. Mitosis

C. Amitosis

D. None

Answer: A



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94. Match the column-I with column-II and select the correct answer.

Column – I

Column – II

- | | | |
|----------------|-------|-----------------|
| (A) Pachytene | (i) | Synizesis |
| (B) Zygotene | (ii) | Chiasma visible |
| (C) Diplotene | (iii) | Terminalisation |
| (D) Leptotene | (iv) | Gene exchange |
| (E) Diakinesis | (v) | Synapsis |

A. (A)-(i),(B)-(ii),(C)-(iii),(D)-(iv),(E)-(v)

B. (A)-(iv),(B)-(v),(C)-(ii),(D)-(i),(E)-(iii)

C. (A)-(iii),(B)-(iv),(C)-(v),(D)-(ii),(E)-(i)

D. (A)-(ii),(B)-(iii),(C)-(iv),(D)-(i),(E)-(v)

Answer: B



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95. Which division is characteristic of cartilage cells, meganucleus of paramoecium and foetal membranes?

- A. Mitosis
- B. Meiosis
- C. Cryptomitosis
- D. Amitosis

Answer: A



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96. Which part of plant is suitable for the study of meiosis?

- A. Root apex
- B. Ovary

C. Anther

D. Shoot apex

Answer: C



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97. Colchicine, a mitotic poison, arrests the cell division in

A. G_1 phase

B. G_2 phase

C. Anaphase

D. Metaphase

Answer: D



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98. Amitosis is a characteristic of

- A. Higher plants
- B. Higher animals
- C. Bryophyta
- D. Lower organisms

Answer: D



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99. Movement of chromosomes during anaphase

- A. Astral rays
- B. Centrioles
- C. Kinetochore
- D. Kinetochore and spindle fibres

Answer: D



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100. Nuclear envelope reappears at

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

Answer: D



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101. Slipping of chiasmata towards the ends of bivalent is called :-

- A. Terminalisation

B. Diakinesis

C. Interkinesis

D. Heteropycnosis

Answer: A



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102. Duplication of chromosomes without the division of nucleus is called

A. Cytokinesis

B. Plasmotomy

C. Endomitosis

D. Dinomitosis

Answer: C



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103. Which division maintains genetic similarity?

- A. Mitosis
- B. Amitosis
- C. Reduction division
- D. Meiosis

Answer: A



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104. Best material for studying mitosis in laboratory is

- A. Anther
- B. Root tip
- C. Leaf tip
- D. Ovary

Answer: B

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Assertion Reasoning Questions

1. A : Endomitosis does not cause karyokinesis or cytokinesis .

R : In endomitosis, mitosis occurs with nucleus.

- A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
- B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.
- C. If Assertion is true, but Reason is false.
- D. If both Assertion and Reason are false.

Answer: A

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2. A : Synaptonemal complex develops between two synapsed homologous chromosomes.

R : Mitosis cannot be completed without the synaptonemal complex.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is true, but Reason is false.

D. If both Assertion and Reason are false.

Answer: C



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3. A : During anaphase-II chromatids of a chromosome separate

R : Centromere of a mitotic chromosome divides during anaphase.

A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.

C. If Assertion is true, but Reason is false.

D. If both Assertion and Reason are false.

Answer: B



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4. A : Each chromosome of bivalent attaches with two spindles in metaphase. Reason : in metaphase bivalents migrate towards metaphasic plate

- A. If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
- B. If both Assertion and Reason are true, but the Reason is not the correct explanation of the Assertion.
- C. If Assertion is true, but Reason is false.
- D. If both Assertion and Reason are false.

Answer: D

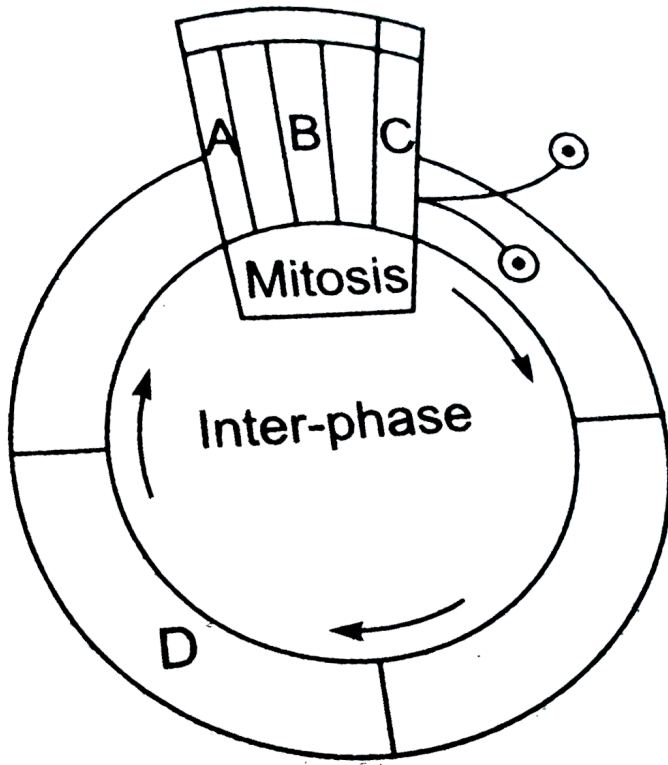


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Archives Chose The Corrcct Option

1. Given below is a schematic break-up of the phases/stages of cell cycle. Which one of the following is the correct indication of the stage/phase in

the cell cycle?



A. A-cytokinesis

B. B-Prophase

C. C-Karyokinesis

D. D-synthetic phase

Answer: D



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2. Synapsis occurs between:

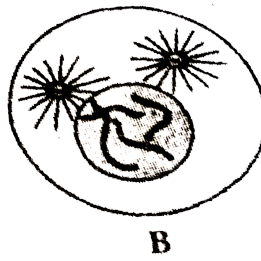
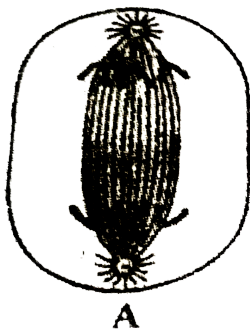
- A. two homologous chromosomes
- B. a male and a female gamete
- C. mRNA and ribosomes
- D. spindle fibres and centromere

Answer: A



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3. Which stages of cell division do the following figures A and B represent respectively?



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

Answer: C

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4. During mitosis ER and nucleolus begin to disappear at

- A. Late prophase
- B. Early metaphase

C. Late metaphase

D. Early prophase

Answer: D



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5. Select the correct option with respect to mitosis

A. Chromosomes move to the spindle equator and get aligned along equatorial plate in metaphase

B. Chromatids separate but remain in the centre of the cell in anaphase

C. Chromatids start moving towards opposite poles in telophase

D. Golgi complex and endoplasmic reticulum are still visible at the end of prophase

Answer: A



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6. During gamete formation, the enzyme recombinase participates during

- A. Anaphase II
- B. Prophase I
- C. Prophase II
- D. Metaphase I

Answer: B



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7. Given below is the representation of a certain event at a particular stage of a type of cell division. Which is this stage?



- A. Prophase of mitosis

B. Both prophase and metaphase of mitosis

C. Prophase-I during meiosis

D. Prophase-II during meiosis

Answer: C



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8. The complex formed by a pair of synapsed homologous chromosomes is called

A. Equatorial plate

B. Kinetochore

C. Bivalent

D. Axoneme

Answer: C



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9. The enzyme recombinase is required at which stage of meiosis

- A. Pachytene
- B. Zygotene
- C. Diplotene
- D. Diakinesis

Answer: C



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10. In 'S' phase of the cell cycle

- A. amount of DNA doubles in each cell
- B. amount of DNA remains same in each cell
- C. chromosome number is increased
- D. amount of DNA is reduced to half in each cell

Answer: A



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11. During which phase(s) of cell cycle, amount of DNA in a cell remains at 4C level if the initial amount is denoted as 2C?

A. G_0 and G_1

B. G_1 and S

C. Only G_2

D. G_2 and M

Answer: C



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12. A somatic cell that has just completed the S-phase of its cell cycle, as compared to gamete of the same species, has

- A. four times the number of chromosomes and twice the amount of DNA
- B. twice the number of chromosomes and twice the amount of DNA
- C. same number of chromosomes but twice the amount of DNA
- D. twice the number of chromosomes and four times the amount of DNA

Answer: C



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13. Select the correct option

Column-I

- a. Synapsis align homologous
- b. Synthesis of RNA and Protein
- c. Action of enzyme recombinase
- d. Centromeres do not separate but chromatids move towards opposite poles

- A. (a) (b) (c) (d)
(ii) (iii) (iv) (v)
- B. (a) (b) (c) (d)
(ii) (i) (iii) (iv)

- C. (a) (b) (c) (d)
(ii) (iii) (v) (iv)
- D. (a) (b) (c) (d)
(iii) (ii) (v) (i)

Answer: C



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14. Arrange the following events of meiosis in correct sequence :

- (a) Crossing over
- (b) Synapsis
- (c) Terminalisation of chiasmata
- (d) Disappearance of nucleolus

A. (b), (c), (d), (a)

B. (b), (a), (d), (c)

C. (b), (a), (c), (d)

D. (a), (b), (c), (d)

Answer: C



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15. Spindle fibres attach on to

- A. Telomere of the chromosome
- B. Kinetochore of the chromosome
- C. Centromere of the chromosome
- D. Kinetosome of the chromosome

Answer: B



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16. In meiosis crossing over is initiated at

- A. Pachytene
- B. Leptotene
- C. Zygotene

D. Diplotene

Answer: A



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17. Which of the following is not a characteristic feature during mitosis in somatic cells?

- A. Spindle fibres
- B. Disappearance of nucleolus
- C. Chromosome movement
- D. Synapsis

Answer: D



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18. A cell at telophase stage is observed by a student in a plant brought from the field. He tells his teacher that this cell is not like other cells at telophase stage. There is no formation of cell plate and thus the cell is containing more number of chromosomes as compared to other dividing cells. this would result in

- A. Aneuploidy
- B. Polyploidy
- C. Somaclonal variation
- D. Polyteny

Answer: B



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19. During cell growth, DNA synthesis takes place in

- A. G_2 phase

B. M phase

C. S phase

D. G_1 phase

Answer: C



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20. When cells have stalled DNA replication fork, which checkpoint should be predominantly activated?

A. M

B. Both G_2/M and M

C. G_1/S

D. G_2/M

Answer: C



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21. Match the stages of meiosis in Column - I to their characteristic features in Column - II and select the correct option using the codes given below

Column - I	Column - II
1. Pachytene	(i) Pairing of homologous chromosomes
2. Metaphase I	(ii) Terminalization of chiasmata
3. Diakinesis	(iii) Crossing over takes place
4. Zygotene	(iv) Chromosomes align at equatorial plate



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