BIOLOGY

BOOKS - AAKASH SERIES

CELL CYCLE AND CELL DIVISION

Exercise I

1. Growth of multicellular organisms is initiated by

A. Cell division

B. Cell enlargement

C. Cell differentiation

D. Morphogenesis

Answer: A

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2. A cell cycle includes

A. Duplication of genome

B. Duplication of other cell constituents

C. Cell division

D. All

Answer: D

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3. Human cells in culture divide approximately for every

A. 90 minutes

B. 19 minutes

C. 24 hours

D. One hour

Answer: C

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4. Yeast can progress through the cell cycle in about

A. 90 minutes

B. 19 minutes

C. 90 seconds

D. 19 seconds

Answer: A

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5. In human cell cycle, interphase lasts for about

A. 0.7

B. 0.95

C. 0.8

D. 0.25

Answer: B

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6. M phase of cell cycle starts with

A. Duplication of DNA

B. Karyokinesis

C. Cytokinesis

D. Division of chromosomes

Answer: B

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7. During this phase of cell cycle, cell is metabolically active without duplication of DNA

A. M-phase

B. S-phase

C. G_1 phase

D. G_2 phase

Answer: C

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8. The amount of DNA per cell remains same during

A. S, G_2 and metaphase

B. G_1, G_2, M phase

C. Anaphase, Telophase, G_1 phase

D. (1) and (3)

Answer: C

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9. The amount of DNA in a cell in G_1 phase is

A. Half that of S-phase

B. Half that of G_2 phase

C. Half that of prophase

D. All

Answer: D

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10. Centriole replicates during

A. G_1 phase

B. G_2 phase

C. S-phase

D. M-phase

Answer: C

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11. Protein synthesis occurs during

A. S phase and G_1 phase only

B. G_1, G_2 and S phase

C. G_1 and M-phase only

D. S and G_2 phase only

Answer: B

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12. Cells in this stage can enter into G_0 stage

A. S-phase

B. G_2 phase

C. G_1 phase

D. M-phase

Answer: C

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13. These cells of adult animals don't divide

A. Liver cells

B. Heart cells

C. Nerve cells

D. 2 and 3

Answer: D

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14. In animals mitotic cell division is only seen in

A. Haploid somatic cell

B. Diploid somatic cell

C. Diploid meiocytes

D. 1 and 3

Answer: B

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15. Mitotic division is also called equational division because

A. Chromosome number in daughter cell is same

B. Chromosome number in daughter cells and parental cell is same

C. Amount of DNA is same in both the daughter cells

D. Amount of DNA is same in both daughter and parental cell

Answer: B

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16. Two DNA molecule in a cell are observed but not distinct is these phases

A. S and G_2

B. G_2 prophase

C. Metaphase and anaphase

D. G_1 and G_2 phase

Answer: A

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17. Initiation of condensation of chromatin material occurs in

A. Prophase

B. Metaphase

C. Anaphase

D. Telophase

Answer: A

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18. Prophase is characterised by

A. Condensation of chromosomal material

B. Centrioles move towards opposite poles of the cell

C. Initiation of assembly of mitotic spindle

D. All

Answer: D

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19. Spindle fibres are chemically

A. Carbohydrates

B. Proteins

C. Proteins and carbohydrates

D. Proteins and fats

Answer: B

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20. The following disappear at the end of prophase

A. Nucleolus

B. Nuclear envelope

C. Golgi and ER

D. All

Answer: D

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21. Chromosomes are scattered in the cytoplasm during

A. Early metaphase

B. Late metaphase

C. Early anaphase

D. Late anaphase

Answer: A

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22. Condensation of chromosomes is completed and can be observed clearly under microscope during

A. Prophase

B. Metaphase

C. Anaphase

D. Telophase

Answer: B

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23. Kinetochores are disc shaped structures associated with

A. Telomeres

B. Centromeres

C. Chromomeres

D. Secondary constriction

Answer: B

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24. Spindle fibres are attached to kinetochores of chromosomes in

A. a. Metaphase

B. b. Anaphase

C. c.Telophase

D. d. 1 and 2

Answer: D

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25. Chromatids of each chromosome are separated during

A. a. Anaphase

B. b. Anaphase-I

C. c. Anaphase-II

D. d. 1 and 3

Answer: D

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26. Chromosomes with one chromatid move towards the poles of the spindle during

A. 1. Anaphase-I

B. 2. Anaphase

C. 3. Metaphase

D. 4. Metaphase-I

Answer: B

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27. Chromosomes with one chromatid move towards the poles of the spindle during

A. Anaphase-I

B. Anaphse

C. Anaphase-II

D. Metaphase

Answer: A

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28. Chromosomes with two chromatids move towards equator of spindle during

A. Anaphase

B. Anaphase-I

C. Anaphase-II

D. Metaphase

Answer: D

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29. The following character is not observed during Anaphase

A. Centromere splits

B. Chromatids move towards equator

C. Chromatids move towards poles

D. Centromeres of chromatids are oriented towards poles

Answer: B

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30. In telophase stage chromosomes decondense and lose their individuality.

A. Prophase

B. Metaphase

C. Anaphase

D. Telophase

Answer: D

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31. The following are reformed during Telophase

A. Nucleolus

B. Golgi complex

C. ER

D. All

Answer: D

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32. Example for coenocytic condition is

A. Liquid endosperm of coconut

B. Solid endosperm of coconut

C. Telophase-II

D. 1 and 2

Answer: A

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33. Precursor of cell wall is

A. Middle lamellum

B. Cell plate

C. Mitotic spindle

D. Metaphase plate

Answer: B

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34. Cell division usually involves

A. Karyokinesis followed by cytokinesis

B. Karyokinesis preceded by cytokinesis

C. Cytokinesis followed by karyokinesis

D. 1 and 3

Answer: A

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35. In animal cells, cytokinesis is achieved by

A. Cell furrow method

B. Cell plate method

C. Both

D. None

Answer: A

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36. In some lower plants and in some social insects mitosis occurs in

A. Diploid cells

B. Haploid cells

C. Both haploid and diploid cells

D. None

Answer: B

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37. Significance of mitosis is

A. Growth of multicellular organisms

B. Maintains nucleo-cytoplasmc ratio

C. Cell repair

D. All

Answer: D

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38. The following types of cells are constantly replaced by new cells formed as a result of mitosis

A. Upper layer of the epidermis

B. Cells of the lining of the gut

C. Blood cells

D. All

Answer: D

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39. Restoration of haploid phase in the life cycle of sexually reproducing organisms, takes place by

A. Amitosis

B. Mitosis

C. Binary fission

D. Meiosis

Answer: D

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40. Meiosis occurs during

A. Sporogenesis

B. Gametogenesis

C. Embryogenesis

D. 1 and 2

Answer: D

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41. Parental chromosome produce two identical sister chromatids during

A. G_1 phase

B. G_2 phase

C. S-phase

D. Prophase

Answer: C

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42. The following event is incorrect with reference to meiosis

A. Nucleus divides twice

B. Chromosomes divide twice

C. Chromosomes divide once

D. Centromere divides once

Answer: B

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43. DNA replication occurs

A. During meiosis

B. Before meiosis

C. After meiosis

D. During mitosis

Answer: B

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44. Prophase-I is divided into five phases based on

A. Chromosome number

B. Time duration

C. Chromosome behaviour

D. Crossing over patterns

Answer: C

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45. The longest stage of meiosis is

A. Prophase-I

B. Prophase-II

C. Anaphase-I

D. Metaphase-I

Answer: A

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46. Chromosomes are first visible under light microscope during

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

Answer: A

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47. Bivalents first appear during

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

Answer: B

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48. Synapsis' involves pairing of

A. Non-homologous chromosome

B. Homologous chromosomes of different parents

C. Non-Homologous chromosomes of same parent

D. Non-Homologous chromosomes of different parents

Answer: B

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49. When are bivalents of chromosomes first clearly visible in meiosis ?

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

Answer: B

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50. Bivalent chromosomes clearly appears as tetrad in

A. Zygotene

B. Diplotene

C. Pachytene

D. Diakinesis

Answer: C

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51. Relatively longer and complex stage of prophase-I

A. Leptotene

B. Diplotene

C. Zygotene

D. Pachytene

Answer: D

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52. Recombinase enzyme is synthesised in

A. Prophase-I

B. Prophase-II

C. Metaphase-II

D. Metaphase-II

Answer: A

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53. Number of recombination nodules is relatively more in

A. Leptotene

B. Zygotene

C. Pachytene

D. Diakinesis

Answer: C

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54. Most important stage for the evolution of new species is

A. Leptotene

B. Zygotene

C. Pachytene

D. Diplotene

Answer: C

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55. In oocytes of some vertebrates, diplotene lasts for months or years. It is called

A. Zygotene

B. Pachytene

C. Diplotene

D. Diakinesis

Answer: C

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56. Diakinesis is marked by

A. Synapsis

B. Crossing over

C. Seggregation

D. Terminalization

Answer: D

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57. Bivalents align on the equatorial plate during

A. Metaphase

B. Metaphase-I

C. Metaphase-II

D. 2 and 3

Answer: B

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58. Chromosomes with two chromatids move towards poles in

A. Anaphase

B. Anaphase-I

C. Anaphase-II

D. Metaphase-I

Answer: B

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59. This stage is called as 'Dyad of cells'

A. Anaphase-I

B. Telophase-I

C. Metaphase-I

D. Prophase-I

Answer: B

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60. The following is incorrect with regard to meiosis

A. Nuclear envelope disappears twice

B. Nuclear envelope reappears twice

C. DNA content of daughter cells is reduced to $1/4^{th}$ of Parental cell

D. DNA replicates twice

Answer: D

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61. Growth of multicellular organisms is initiated by

A. Cell division

B. Cell enlargement

C. Cell differentiation

D. Morphogenesis

Answer: A

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Exercise Ii

1. Mitotic cycle can be best observed in _____

A. Meristematic cells

B. Sievetubes

C. Root cap cells

D. Pollen mother cells

Answer: A

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2. Find the correct statements with respect to replication of DNA in cell division

A. It occurs during G_1-phase of interphase

B. New strands complimentary to old strands are synthesized with the help of endo-nucleases

C. Two strands of DNA unwind from each other due to DNA polymerase

D. It occurs by semi-conservation method

Answer: D

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3. In a Meristematic cell, DNA quantity becomes double in

A. G_1-sub phase

B. S-sub phase

C. G_2-sub phase

D. Prophase

Answer: B

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4. Number of chromatids in G_1 and G_2 respectively in a somatic cell with 2n=20

A. 40,20

B. 20,40

C. 10,20

D. 10,40

Answer: B

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5. In mitosis, each chromosome splits longitudinally and appear as two chromatids for the first time in

A. Early metaphase

B. Mid prophase

C. Plane of alignment of chromosomes at equator

D. Telophase

Answer: B

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6. Equatorial plate of metaphase refers to

A. A fluid plate

B. Cell plate

C. Chromosomes arranged as plate

D. Phragmoplast

Answer: C

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7. Number of DNA molecules in a metaphase chromosome is

A. Many

B. Three

C. One

D. Two

Answer: D

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8. Centromeric division occurs during

A. Prophase

B. Metaphase

C. Anaphase

D. Interphase

Answer: C

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9. If each cell of the spore tetrad has 7 chromosomes, how many chromosomes are found in a dividing root tip cell in anaphase?

A. 7

B. 14

C. 21

D. 28

Answer: B

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10. The centromere spilts during

A. Metaphase

B. Anaphase

C. Telophase

D. Prophase

Answer: D

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11. A barrel shaped structure organised at interzonal region by remaining spindle fibers at the end of telophase is

A. Tonoplast

B. Phragmoplast

C. Mitoplast

D. Tyloses

Answer: B

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12. Condensation and decondensation of chromosomes occurs respectively in

A. Prophase and Metaphase

B. Anaphase and Metaphase

C. Prophase and Anaphase

D. Prophase and Telophase

Answer: D

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13. Precursor of cell plate is

A. Phragmoplast

B. Middle lamellum

C. Primary cell wall

D. Secondary cell wall

Answer: A

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14. Identify the correct statements

A. Each metaphasic chromosome shows 4DNA molecules

B. Each metaphasic chromatid shows one DNA molecule

C. Each chromatid shows two DNA molecules in all stages of meiosis

D. Early anaphasic chromosomes shows one DNA but two kinetochore discs

Answer: B

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15. Which one is not possible due to mitosis?

A. Wound healing

B. Regeneration

C. Grafting

D. Reduction of chromosome number

Answer: D

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16. When compared to G_1 phase of mitosis quantity of DNA in nucleus of each daughter cell will be

A. Half as much as in parent nucleus

B. Same as much as in parent nucleus

C. Twice as much as parent nucleus

D. Highly variable

Answer: B

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17. When 16 cells are formed from a single cell, how many times cells divide and how many cells are formed in the 3rd generation?

A. 4 and 8

B. 4 and 7

C. 3 and 8

D. 4 and 16

Answer: A

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18. Number of gamete produced by a meiocyte

A. 1

B. 2

C. 3

D. 4

Answer: A

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19. Meiosis in plant occurs, when there is a change from

A. Gametophyte to sporophyte

B. Sporophyte to sporophyte

C. Sporophyte to gametophyte

D. Gametophyte to gametophyte

Answer: C

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20. Meiosis is characterised by

A. Two nuclear division with chromosomes divide twice

B. Two times nuclear division with chromosome dividing one time

C. Two nuclear division with chromosome dividing four times

D. One nuclear division with chromosome dividing one time

Answer: B

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21. Process which is antithetical to fertilization is

A. Mitosis

B. Meiosis

C. Vegetative propagation

D. Apomixis

Answer: B

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22. The subphase of prophase-I showing disintegration of nuclear membrane and nucleoli respectively are

A. Leptotene, Zygotene

B. Zygotene, Pachytene

C. Zygotene, Diplotene

D. Diakinesis, Diplonema

Answer: A

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23. If each cell of the spore tetrad contains 4 chromosomes, how many pachytene tetrads are found in the meiocyte of that plant?

A. 2

B. 8

C. 4

D. 16

Answer: C

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24. Regions of crossing over are indicated cytologically by

A. Chromomeres

B. Chiasmata

C. Centromeres

D. Telomeres

Answer: B

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25. Enzymes help in crossing over

A. Endonuclease and ligase

B. Restriction endonuclease and ligase

C. Endonuclease and exonuclease

D. Polymerase and endonuclase

Answer: A

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26. What is the ratio of the number of chromatids, chromosomes, bivalents and centromeres respectively in a cell during metaphase-I?

A. $1:2:2:1$

B. $4:2:2:1$

C. $4:2:1:2$

D. $2:1:2:1$

Answer: C

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27. Chromosomes of the bivalent are fused (Joined) by their chiasmata near the telomeric ends during

A. Pachytene

B. Zygotene

C. Metaphase-I

D. Anaphase-I

Answer: C

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28. Movement of bivalents towards the periphery of the nucleus and their movement towards equator of the meiocyte occur respectively during

A. Diakinesis and anaphase I

B. Diplotene and diakinesis

C. Leptotene and diakinesis

D. Diakinesis and metaphase

Answer: D

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29. Genomes migrate to opposite poles by the end of

A. Anaphase-I

B. Telophase-I

C. Diakinesis

D. Cytokinesis

Answer: A

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30. In angiosperms the number of meiotic divisions required to produce 100 macrospores is

A. 25

B. 50

C. 100

D. 125

Answer: D

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31. During meiosis, when the paternal and maternal chromosomes brought together and separated respectively?

A. Zygotene & Anaphase-II

B. Prophase-II & Anaphase-I

C. Zygotene & Anaphase-I

D. Leptotene & Telophase-I

Answer: C

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32. Number of spindle apparatus formed during the formation of one hundred microspores from microspore mother cells is

A. 25

B. 75

C. 50

D. 100

Answer: B

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33. How many reductional divisions are required to form 400 synergids?

A. 400

B. 300

C. 200

D. 100

Answer: C

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34. Chromosomes of the bivalent lie very close to each other and far separated from each other, respectively during

A. Zygotene and diakinesis

B. Leptotene and anaphase-I

C. Leptotene and diplotene

D. Anaphase-I and anaphase-II

Answer: A

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35. What happens when cytokinesis fails permanently after karyokinesis in mitosis?

A. Cell remains same

B. Cell becomes coenocytic

C. Cell becomes free nuclear

D. Cell becomes dikaryotic

Answer: B

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36. The ratio of chromosomes moving to each pole during Anaphase-II to those moving to each pole during Anaphase-I

A. $1:1$

B. $1:2$

C. $2:1$

D. $1:4$

Answer: A

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37. During meiosis spindle formation in initiated during

A. Zygotene of Prophase-I

B. Pachytene of Prophase-I

C. Metaphase-I

D. Interphase

Answer: A

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38. During cell cycle, every chromosome contains two DNA molecules from

A. G_1-subphase to Anaphase

B. G_2-subphase to Anaphase

C. S-subphase to Metaphase

D. S-subphase to Anaphase

Answer: C

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39. A bacterial cell divides once every minute and takes an hour to fill a cup. How much time will it take to fill half the cup ?

(a) 60 minutes

(b) 59 minutes

(c) 30 minutes

(d) 15 minutes

A. 30 min

B. 59min

C. 58min

D. 15 min

Answer: B

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40. Meiosis is characterised by

A. Two successive divisions of cytoplasm, nuclei and chromosomes

B. Two successive division of cytoplasm and nuclei accompanied by one replication of chromosomes

C. One division of cytolplasm and Nuclei accompanied by Replication of chromosomes twice

D. One division of cytoplasm and Nuclei accompanied by replication of chromosomes once.

Answer: B

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41. Mendelian recombinations are due to

A. Crossing over

B. Synapsis

C. Chromosomal congression

D. None

Answer: C

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42. What type of cell division takes place in the functional megaspore initially in angiosperms?

A. Homeotypic without cytokinesis

B. Reductional without cytokinesis

C. Somatic followed by cytokinesis

D. Meiotic followed by cytokinesis

Answer: A

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43. In a flowering plant the largest number of haploid cells occurs in

A. Ovule

B. Microsporangium

C. Root apex

D. Cambium

Answer: B

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44. Cholchicine interferes in

A. DNA replication

B. Organization and orientation of spindle

C. Chromosome condensation

D. None of the above

Answer: B

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45. Daughter cells formed as a result of meiosis are not similar to that of parent cell because

A. Meiosis is completed in two stages

B. Prophase is the longest phase

C. Nucleus size increases in daughter cells

D. Crossing over takes place and chromosome number is halved

Answer: D

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46. Generation Time is

A. Period between telophase and cytokinesis

B. Time gap between meiosis-II and cytokinesis

C. Period of time taken by a cell to double

D. All are correct

Answer: C

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47. Mitotic apparatus is a temporary structure which

A. disappears in prophase

B. reappears in telophase

C. persists in cytokinesis of plant cells

D. All are correct

Answer: C

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48. Phragmoplast is related to

A. Proplastid in cytoplasm of dividing cell

B. Cell plate formed by vesicles of ER and microfilament during cytokinesis

C. Cell plate formed during ER, dictyosomes, secretory vesicles and spindle fibres

D. None of the above

Answer: C

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49. In meiosis I, a bivalent is an association of

A. Four chromosomes and four centromeres

B. Four chromatids and two centromeres

C. Two chromatids and two centromeres

D. Two chromatids and one centromere

Answer: B

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50. During mitotic cycle what occurs first?

A. Cytoplasmic division

B. Spindle formation

C. Movement of chromosomes

D. Chromosome duplication

Answer: D

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51. Middle lamella starts forming during

A. I-Phase

B. Late metaphase

C. Spindle apparatus

D. Late anaphase

Answer: D

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52. If the leaf cell has 16 chromosomes, then it is most likely that

A. Gametes will have 16 chromosomes

B. Gametes will have 8 chromosomes

C. Zygote will have 8 chromosomes

D. Zygote will have 32 chromosomes

Answer: B

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53. A cell with 2n=16 undergoes meiosis. Each of the four daughter nuclei formed at the end of the division will have

A. 4 chromosomes- double stranded

B. 8 chromosomes- single stranded

C. 8 chromosomes- double stranded

D. 4 chromosomes- single stranded

Answer: B

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54. Which stage is responsible for genetic variations and evolution of species ?

A. Diplotene

B. Diakinesis

C. Pachytene

D. Anaphase-II

Answer: C

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55. In a cell cycle G_1 phase is marked by the

A. Transcription of r-RNA

B. Transcription of r-RNA, t-RNA

C. Transcription of r-RNA, m-RNA

D. Transcription of r-RNA, m-RNA, t-RNA and synthesis of different proteins

Answer: D

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56. During diakinesis chiasmata move from centromere towards the tip of the chromosomes. This type of movement of chiasmata is called

A. Synapsis

B. Bivalent formation

C. Terminalization

D. crossing over

Answer: C

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57. Synaptonemal complex is found associated with

A. Amitotic chromosomes

B. Iampbrush chromosomes

C. Mitotic chromosome

D. Paired meiotic chromosomes

Answer: D

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58. Synaptinemal complex permits

A. Disjunction

B. The proper alignment of the homologous chromosomes

C. Congression

D. All of the above

Answer: C

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59. Synaptionemal complex first appear :-

A. Zygotene during chromosomes pairing

B. Pachytene during crossing over

C. Diplotene during chiasmata formation

D. Diakinesis during terminalization

Answer: A

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60. The second spindle formed in Merosis-II is formed

A. At right angle to first spindle

B. Parallel to first spindle

C. Oblique to the axis

D. At any site in the cell

Answer: A

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61. Number of spindle apparatus formed during meiosis is

A. 3

B. 2

C. 1

D. 4

Answer: A

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62. How many meiosis are required to produce 101 seeds?

A. 125

B. 126

C. 127

D. 404

Answer: C

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63. In meiosis centromeres divide and chromatids separate during

A. Anaphase I

B. Anaphase II

C. Metaphase I

D. Prophase I

Answer: B

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64. Phase of cell cycle when DNA polymerase is active

A. M

B. G_1

C. G_2

D. S

Answer: D

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65. Crossing over occurs between

A. Two bivalents

B. Non-sister chromatids of a bivalent

C. Sister chromatids of a bivalent

D. Two nuclei

Answer: B

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66. Mitotic cell cycle is divided into 4 phases G_1, S G_2 and M. Considering a mitotic cycle time of 18 hours the distributing of period of time (in hours) for each of these phases will most likely be

A.

G_1	S	G_2	M
1	3	5	9

B.

G_1	S	G_2	M
9	1	3	5

C.

G_1	S	G_2	M
9	5	3	1

D.

G_1	S	G_2	M
3	4	9	1

Answer: C

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67. Post mitotic gap phase and synthetic phases of cell cycle are also respectively referred to as

A. G_2 and S

B. G_1 and S

C. G_1 and G_2

D. S and G_2

Answer: B

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68. Which one of the following pair is correctly matched?

A. Shortest phase of cell cycle -M-phase

B. Synthesis of histone protein -G_2- phase

C. DNA replication -G_1- phase

D. Synthesis of RNA and protein -M-phase

Answer: A

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69. If the DNA content of a cell is 2C after M phase, what will be the DNA content of the cells at G_1, after S and at G_2

A. 4C, 4C, 8C

B. 2C, 2C, 4C

C. 2C, 4C, 8C

D. 2C, 4C, 4C

Answer: D

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70. Match List I (Distinguishing features based on chromosomal appearance) with List -II (Stage of meiosis) and select the correct answer using the codes given below the list

	List-I		List-II
(A)	Terminalized chaismata	1	Pachytene
(B)	Exchange of segments of chromatids	2	Zygotene
(C)	Synapsis of homologous chromosomes	3	Diakinesis
(D)	Appearance of chiasmata	4	Leptotene
		5	Diplotene

A. $\begin{matrix} A & B & C & D \\ 4 & 2 & 3 & 1 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 3 & 1 & 2 & 5 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 2 & 5 & 1 & 3 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 2 & 4 & 3 & 1 \end{matrix}$

Answer: B

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71. Cell division is tightly regulated. Which of the following is TRUE regarding mitosis OR meiosis?

I. Mitosis shows no homologue pairing

II. There is no S phase between meiosis I and II

III. Meiosis centromeres do not divide at anaphase I.

A. I and III only

B. I and II only

C. II only

D. I, II and III

Answer: D

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72. In which phase of cell division is oocyte arrested ?

A. anaphase II

B. Prophase I

C. interphase

D. Both prophase I and II

Answer: B

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73. Synapsis occurs between :-

A. Spindle fiber and centromere

B. Two homologous chromosomes

C. A male and a female gamete

D. mRNA and ribosomes

Answer: B

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74. Recombination is completed by the end of

A. Zygotene

B. Leptotene

C. Pachytene

D. Diplotene

Answer: C

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75. Most of the histone production during cell cycle occurs in

A. G_0 phase

B. G_1 phase

C. S phase

D. G_2 phase

Answer: C

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76. In animal cell DNA replication begins during the

A. S-phase

B. G_1-phase

C. G_2- phase

D. M-phase

Answer: A

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77. Which stage is marked by terminalization of chiasmata?

A. Zygotene

B. Pachytene

C. Diplotene

D. Diakinesis

Answer: D

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78. At metaphase, chromosomes are attached to the spindle fibres by their

A. Satellites

B. Secondary constrictions

C. Kinetochores

D. Centromere

Answer: C

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79. Select the correct option with respect to mitosis

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

B. Chromatids start moving towards opposite pole in telophase

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

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

Answer: D

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80. Spindles are arrested by colchicine at

A. anaphase

B. metaphase

C. telophase

D. prophase

Answer: B

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81. Which one of the following is not considered as a part of the endomembrane system ?

A. golgi complex

B. peroxisome

C. vacuole

D. lysosome

Answer: B

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82. The Chiasmata is formed during which stage of Prophase-I of the Meiotic cell division?

A. Diplotene

B. Pachytene

C. Leptotene

D. Zygotene

Answer: A

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83. Crossing over is also an enzyme mediated process and the enzyme involved is called

A. Recombinase

B. Endonuclease

C. Polymerase

D. Ligases

Answer: A

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84. Identify the meiotic stage in which the homologous chromosomes separate while the sister chromatids remain associated at their centrometres. Or In which stage of meiosis homologous chromosomes are segregated

A. Anaphase I

B. Anaphase II

C. Metaphase I

D. Metaphase II

Answer: A

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85. Chromosomal segregation occurs during

A. Metaphase I

B. Anaphase II

C. Prophase I

D. Anaphase I

Answer: D

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86. During gamete formation, the enzyme recombinase participates during

A. Anaphase-II

B. Prophase-I

C. Prophase_II

D. Metaphase-I

Answer: B

Watch Video Solution

87. Chiasmata can be distinctively seen in

A. Zygotene

B. Pachytene

C. Diplotene

D. Diakinesis

Answer: C

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88. In 'S' phase of the cell cycle

A. Amount of DNA is reduced to half in each cell

B. Amount of DNA doubles in each cell

C. Amount of DNA remains same in each cell

D. Chromosome number is increased

Answer: B

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

A. Bivalent

B. Axoneme

C. Equatorial

D. Kinetochore

Answer: A

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90. 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_2 and M

B. G_0 and G_1

C. G_1 and S

D. only G_2

Answer: D

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91. The enzyme recombinase is required in which stage of meiosis

A. Diakinesis

B. Pachytene

C. Zygotene

D. Diplotene

Answer: B

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92. Choose the correct combination

List-I	List-II
(A) Walter sutton	(I) Discovered penicillin
(B) Thomas Hunt Morgan	(II) Discovered chromosomal basis of heridity
(C)James Watson	(III) Described the phenomon of linkage and cr
(D) Alexander Fleming	(IV) Discovered double helical structure of DN

A.
A	B	C	D
I	IV	II	III

B.
A	B	C	D
II	III	I	IV

C.
A	B	C	D
III	II	IV	I

D.
A	B	C	D
II	III	IV	I

Answer: D

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93. Match the following

List-I	List-II
A) Mitosis	I) Megaspore mother cell
B) Meiosis	II) Endonuclease
C) Pachytene	III) Division of centromere
D) Anaphase	IV) Generative cell

A. $\begin{matrix} A & B & C & D \\ \text{II} & III & I & IV \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{I} & IV & II & III \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{III} & I & IV & II \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{IV} & I & II & III \end{matrix}$

Answer: D

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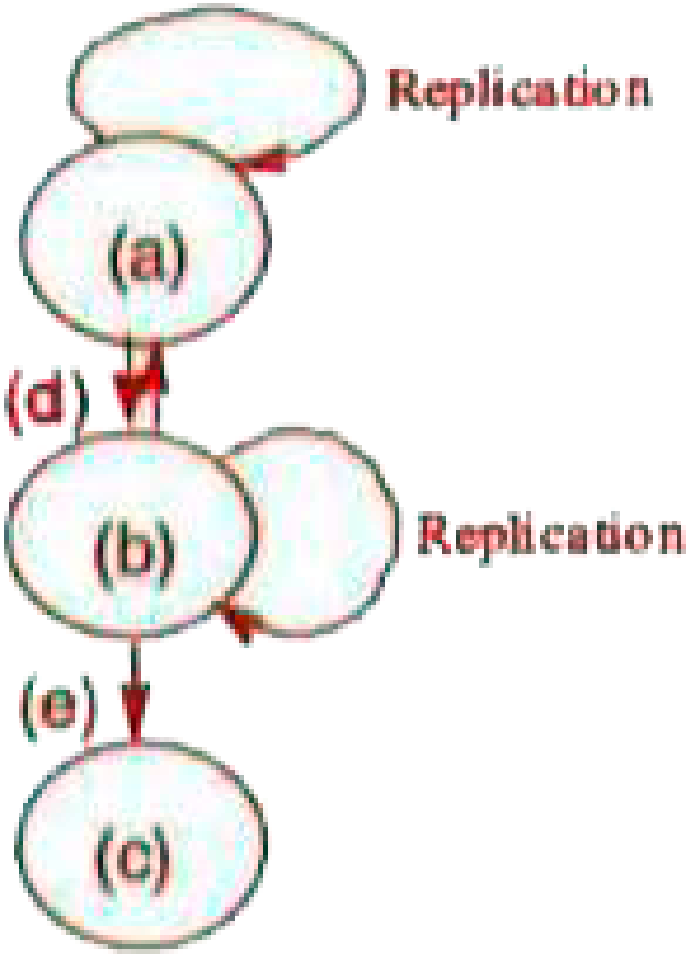
94. Diagram represents 'central dogma' of molecular biology choose. Correct combination of labelling



A. a-protein, b-RNA, c-DNA, d-Translation, e-Transcription

B. a-DNA, b-RNA, c-protein, d-Transciption, e-Translation

C. a-RNA, b-DNA, C-protein, d-Transcription, e-Translation

D. a-Transcription, b-Translation, c-protein, d-DNA, e-RNA

Answer: B

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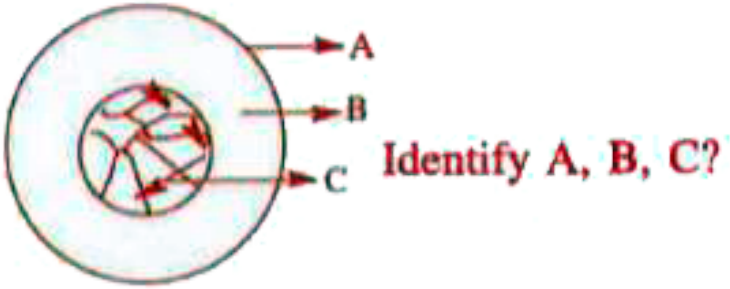

95. Identiy A, B, C?

A. A-Cytoplasm, B=Cell membrane, C=Chromatin

B. A=Chromatin, B=Cytoplasm, C=Cell membrane

C. A=Cell membrane, B=Cytoplasm, C=Chromatin

D. A=Cytoplasm, B=Chromatin, C=Cell membrane

Answer: C

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96. Match the following columns

List-I	List-II
A) Strasburger	I) Coined the term chromatin
B) Flemming	II) Coined the term karyokinesis
C) Schneider	III) Coined the term cytokinesis
D) Whiteman	IV) Somatic division in plant cell

A. $\begin{matrix} A & B & C & D \\ \text{III} & II & IV & I \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{IV} & I & II & III \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{I} & IV & III & II \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{II} & III & I & IV \end{matrix}$

Answer: B

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97. Match the following columns

List-I	List-II
A) V-shaped chromosome	I) telocentric
B) L-shaped chromosome	II) metacentric
C) J-shaped chromosome	III) sub-metacentric
D) I-shaped chromosome	IV) acrocentric

A. $\begin{matrix} A & B & C & D \\ \text{IV} & I & III & II \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ III & II & II & IV \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{I} & IV & III & II \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{II} & III & IV & I \end{matrix}$

Answer: D

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98. Match the following columns

List-I	List-II
A) Zygotene	I) Crossing over
B) Pachytene	II) Terminalization
C) Diplonema	III) Formation of bivalent
D) Diakinesis	IV) Repulsion of paired chromosomes

A. $\begin{matrix} A & B & C & D \\ \text{I} & III & II & IV \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{III} & I & IV & II \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{II} & IV & III & I \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{IV} & II & I & III \end{matrix}$

Answer: B

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99. Identify the correct sequence of the following phase during cell cycle

(I) M-phase (II) S-subphase (III) G_2-subphase (IV) G_1- Subphase

A. IV,II,III,I

B. I,IV,II,III

C. IV,III,II,I

D. II,IV,III,I

Answer: A

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100. Find out the correct sequence of events during meiosis

(I) Disjunction (II) Crossing over (III) Synapsis (IV) Terminalisation

A. III,II,I,IV

B. III,II,IV,I

C. II,III,I,IV

D. III,IV,II,II

Answer: B

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101. Identify the correct ascending sequence of the following aspects of meiosis

(A) Number of spindle apparatus formed (B) Number of chromosomal divisions

(C) Number of cells formed (D) Number of nuclear generation

A. B,C,A,D

B. B,D,C,A

C. D,C,A,B

D. B,D,A,C

Answer: D

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102. Study the following lists:

List-I	List-II
A) Leptotene	I) Bouquet stage
B) Zygotene	II) Synapsis
C) Diakinesis	III) Terminalisation
D) Anaphase II	IV) Centromere divides

The correct match is

A. $\begin{matrix} A & B & C & D \\ \text{II} & IV & III & V \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{II} & IV & I & V \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{I} & II & III & IV \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{IV} & III & II & I \end{matrix}$

Answer: C

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103. Study the following lists:

List-I	List-II
A) Diplotene	I) Increase in the size of nucleolus
B) Zygotene	II) Homologous chromosomes are long and thread like
C) Pachytene	III) Condensation, contraction and thickening chromosomes
D) Leptotene	IV) Occurence of crossing over
	V) Chromosomes released into cytoplasm

The correct match is

A. $\begin{matrix} A & B & C & D \\ \text{III} & I & IV & II \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{III} & I & IV & V \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{V} & IV & I & II \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{II} & IV & V & III \end{matrix}$

Answer: A

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104. Match the following lists:

List-I	List-II
A) Doubling the number of chromosomes	I) G_1-Phase
B) Doubling of the cell organelles	II) S-Phase
C) Doubling of the DNA	III) G_2-Phase
D) Doubling the number of cells	IV) Anaphase
	V) Cytokinesis

The correct match is

A. $\begin{matrix} A & B & C & D \\ \text{II} & I & IV & III \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{II} & III & IV & V \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{IV} & I & II & V \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{IV} & I & II & III \end{matrix}$

Answer: C

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List-I	List-II
A) Leptotene	I) Terminalisation
B) Zygotene	II) Condensation
C) Pachytene	III) Crossing over
D) Diplotene	IV) Synapsis
E) Diakinesis	V) Long and thin chromosomes

105.

The correct match is

A. $\begin{matrix} A & B & C & D & E \\ \text{V} & IV & III & II & I \end{matrix}$

B. $\begin{matrix} A & B & C & D & E \\ \text{III} & V & IV & I & II \end{matrix}$

C. $\begin{matrix} A & B & C & D & E \\ \text{I} & IV & V & III & II \end{matrix}$

D. $\begin{matrix} A & B & C & D & E \\ \text{IV} & II & I & III & V \end{matrix}$

Answer: A

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106. Study the following table:

List-I	List-II
A) Complete disappearance of chiasmata	I) Zygotene
B) Repulsion of homologous chromosomes	II) Anaphase-I
C) Maximum attractive forces between - homologous chromosomes	III) Pachytene
D) Displacement of chiasmata	IV) Diplotene
	V) Diakinesis

A. $\begin{matrix} A & B & C & D \\ \text{V} & III & I & IV \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{V} & II & III & IV \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{II} & IV & I & V \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{II} & I & V & III \end{matrix}$

Answer: C

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List-I	List-II
A) Anaphase-I	I) Repulsion between homologus chromosomes
B) Pachytene	II) Attraction between homologous chromosomes
C) Zygotene	III) Exchange between homologous chromosomes
D) Diplotene	IV) Separation of homologous chromosomes

107.

The correct match is

A. $\begin{matrix} A & B & C & D \\ \text{I} & II & III & IV \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{III} & IV & II & I \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{IV} & III & I & II \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{IV} & III & II & I \end{matrix}$

Answer: D

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108. Arrange the various phenomena of meiosis in a correct sequence

(A) Pairing of homologous chromosomes (B) Separation of genomes (C) Recombination between two chromosomes (D) Chaismata

A. D,B,A,C

B. D,C,A,B

C. A,C,D,B

D. C,D,B,A

Answer: C

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109. Match the following lists:

List-I	List-II
A) Anaphase-I	I) One spindl apparatus
B) Anaphase-II	II) Separation of two genomes
C) Metaphase-II	III) Two spindle apparatii
D) Telophase-II	IV) Separation of two chromatids
	V) Four daughter nuclei

The correct match is

A. $\begin{matrix} A & B & C & D \\ \text{V} & IV & III & II \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ \text{II} & IV & III & V \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ \text{I} & IV & V & III \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ \text{IV} & II & I & III \end{matrix}$

Answer: B

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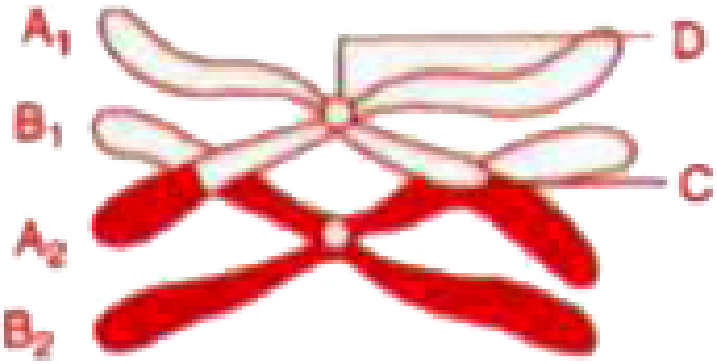
110. Identify the labelled parts of following diagram



A. A_1, A_2 are sister chromatids

B_1, B_2 are non sister chromatids

D= centromere, C= Chaismata

B. A_1, A_2 are sister chromatids

B_1, B_2 are sister chromatids

C=Region of crossing over

D= Centromere

C. A_1, A_2 are non sister chromatids

B_1, B_2 are sister chromatids

C=crossing over, D= centromere

D. A_1, A_2 are sister chromatids

B_1, B_2 are sister chromatids

C= Kinetochore, D=Centromere

Answer: B

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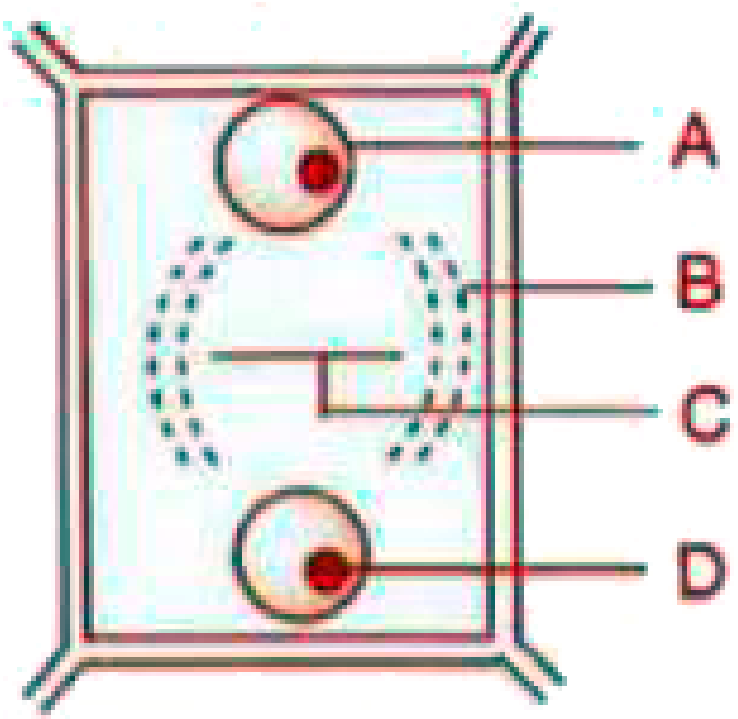
111. Identify the labelled parts of following diagram



A. A=Daughter nucleus B= Nucleolus C=Phragmoplast D=Cell plate

B. A=Daughter nucleus B=Cell plate C= Phragmoplast D=Nucleolus

C. A=Daughter nucleus B=Phragmoplast C=Cell plate D= Ergosome

D. A=Daughter nucleus B=Phragmoplast C=Cell plate D=Plasmosome

Answer: D

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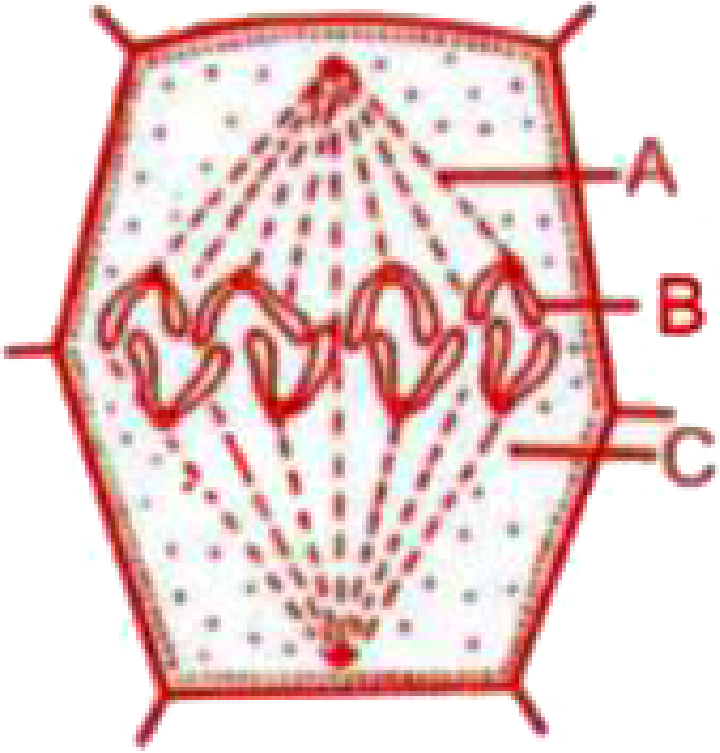
112. Identify the labelled parts of following diagram



A. A=Chromatid B=Equatorial plate C=Interzonal spindle fibres

B. A=Chromosomal spindle fibres B=Interzonal spindle fibre C=Continuous spindle fibres

C. A=Chromosomal spindle fibres B=Chromatid, C=Equatorial plate

D. A=Chromosomal spindle fibres B=Chromosomal spindle fibres C=Equatorial plate

Answer: C

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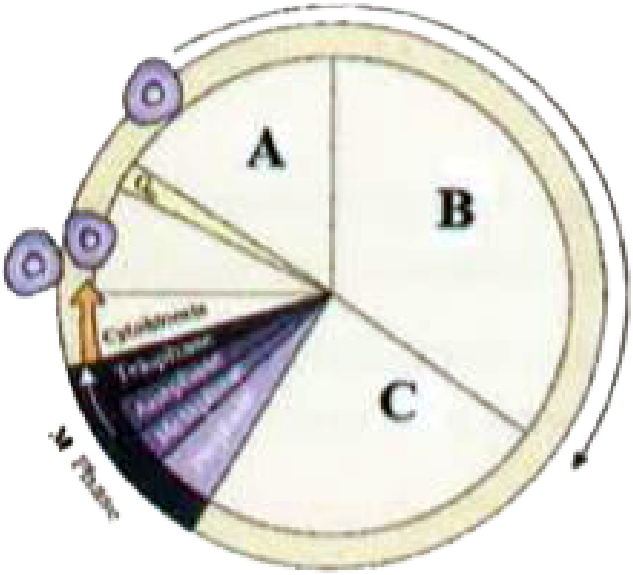
113. Identify that A,B and C from the following



A. A=phase for synthesis of cell organelles B=Phase for translation C=Phase for Heterocatalysis processes

B. A=Phase for synthesis of cell organelles B=Phase of DNA duplication C=Phase for synthesis of major proteins

C. A=Phase for DNA auto catalysis B=Phase for synthesis of major proteins C=Phase for transcription

D. A=Phase for synthesis of cell organelles B=Phase for synthesis of major proteins C=Phase for RNA replication

Answer: B

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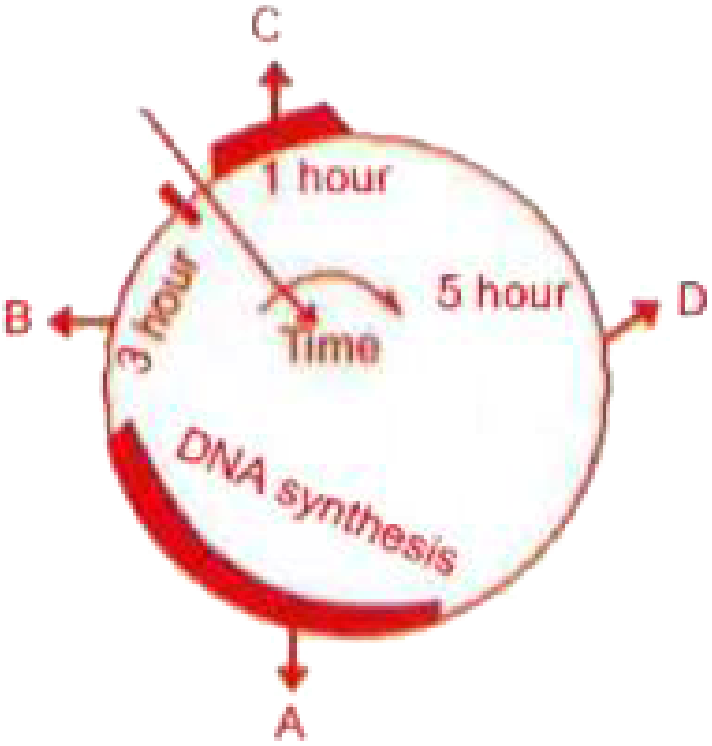

114.

Name the A,B,C,D parts during cell cycle

A. A= G_2 period B= M phase C= S phase D= G_1 period

B. A= S phase B= G_2 period C= M phase D= G_1 period

C. A= G_1 period B= G_2 period C=S phase D=Mphase

D. A = M phase B= Sphase C= G_2 period D= G_1 period

Answer: B

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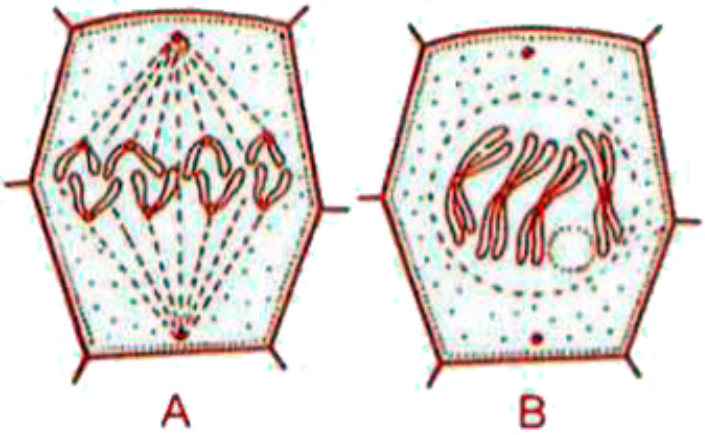
115. Identify the phase A and B



A. A= Metaphase B= Early prophase

B. A= Anaphase B= Early prophase

C. A= Early anaphase B= prophase

D. A = Metaphase B= Pachytene

Answer: C

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116. Identify the subphase A and B

A. A=Late prophase B= Metaphase

B. A = Diplotene B=Diakinesis

C. A= Metaphase B= Diakinesis

D. A= Pachetene B= Diplotene

Answer: A

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Exercise Iii

1. Which of the following options gives the correct sequences of events during mitosis?

A. Condensation $\rightarrow$ nuclear membrance disassembly $\rightarrow$ crossing over $\rightarrow$ segregation $\rightarrow$ telophase

B. Condensation $\rightarrow$ nuclear membrance disassembly $\rightarrow$ arrangement at equator $\rightarrow$ centromere division $\rightarrow$ segregation $\rightarrow$ telophase

C. Condensation $\rightarrow$ crossing over $\rightarrow$ nuclear membrance disassembly $\rightarrow$ segregation $\rightarrow$ telophase

D. Condensation $\rightarrow$ arrangement at equator $\rightarrow$ centromere division $\rightarrow$ segregation $\rightarrow$ telophase

Answer: B

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2. During which phase of meiosis do homologous chromosomes separate ?

A. Prophase-I

B. Prophase II

C. Anaphase I

D. Anaphase II

Answer: C

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3. Which of the following statements is correct with respect to cell cycle?

A. A cell in G1 phase has double the amount of DNA than a cell in G2 phase

B. Each chromosome has two chromatids in G1 phase

C. Nerve cells in adult human are in GO state

D. DNA content of cell remains constant during entire cell cycle

Answer: C

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4. 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: D

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5. 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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6. Which of the following stage of meiosis the enzyme recombinase is required?

A. Pachytene

B. Zygotene

C. Diplotene

D. Diakinesis

Answer: A

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

A. equatorial plate

B. Zygotene

C. bivalent

D. axoneme

Answer: C

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8. Meiosis takes place in

A. meiocyte

B. conidia

C. gemmule

D. megaspore

Answer: A

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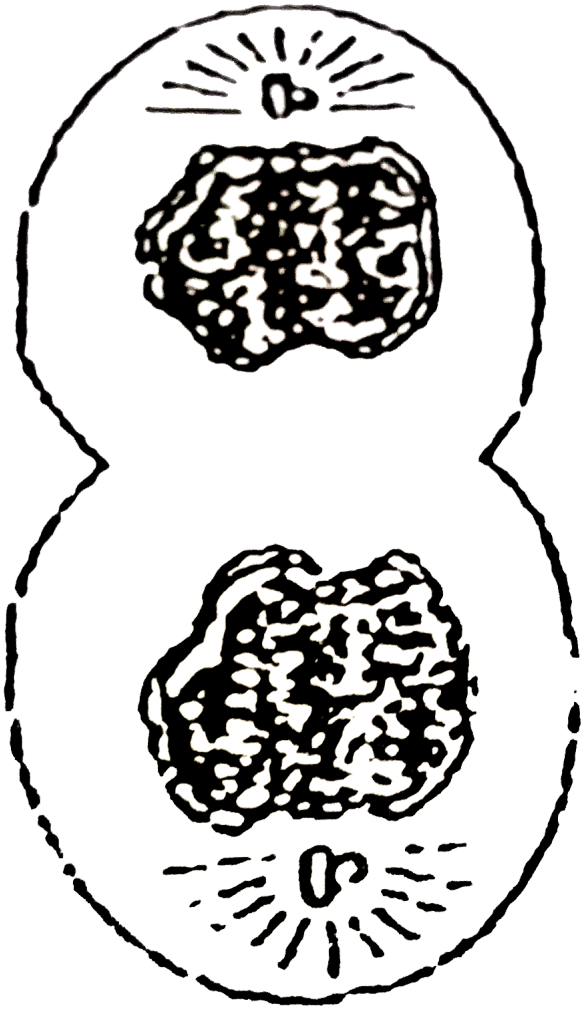
9. A stage in cell division is shown in the figure. Select the answer which gives correct identification of the stage with its characteristics.



(1) Cytokinesis	cell plate formed, mitochondria distributed between two daughter cells.
(2) Telophase	endoplasmic reticulum and nucleolus not reformed yet.
(3) Telophase	nuclear envelop reforms, golgi complex reforms.
(4) Late anaphase	chromosomes move away from equatorial plate, golgi complex not present.

A. Telophase-Nuclear envelope reforms, Golgi complex reforms

B. Late anaphase-Chromosomes move away from equatorial plate, Golgi complex not present

C. Cytokinesis-Cell plate formed, mitochondria distributed between two daughter cells

D. Telophase-Endoplasmic reticulum and nucleolus not reformed yet

Answer: A

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10. The given figure is the representation of a certain event at a particular stage of a type of cell division. Which is this stage ?

A. Prophase-I during meiosis

B. Prophase-II during meiosis

C. Prophase of mitosis

D. Both prophase and metaphase of mitosis

Answer: A

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11. During gamete formation, the enzyme recombinase participates during

A. metaphase-I

B. anaphase-II

C. prophase-I

D. prophase-II

Answer: C

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12. During mitosis ER and nucleolus begin to disappear at

A. Late prophase

B. Early metaphase

C. Late metaphase

D. Early prophase

Answer: C

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13. Select the correct option with respect to mitosis

A. Chromatids starts moving towaring opposite poles in telophase

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

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

D. Chromatids separate but remains in the centre of the cell in anaphase

Answer: D

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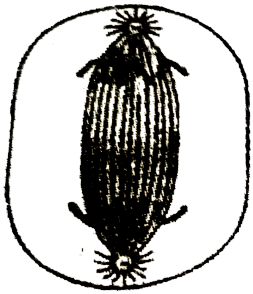
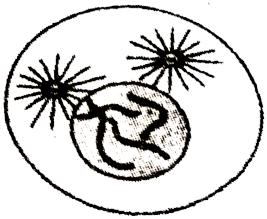
14. Which stages of cell division do the following figures A and B represent respectively?



A



B

A. Metaphase-Telophase

B. Telophase-Metaphase

C. Late Anaphase-Prophase

D. Prophase-Anaphase

Answer: C

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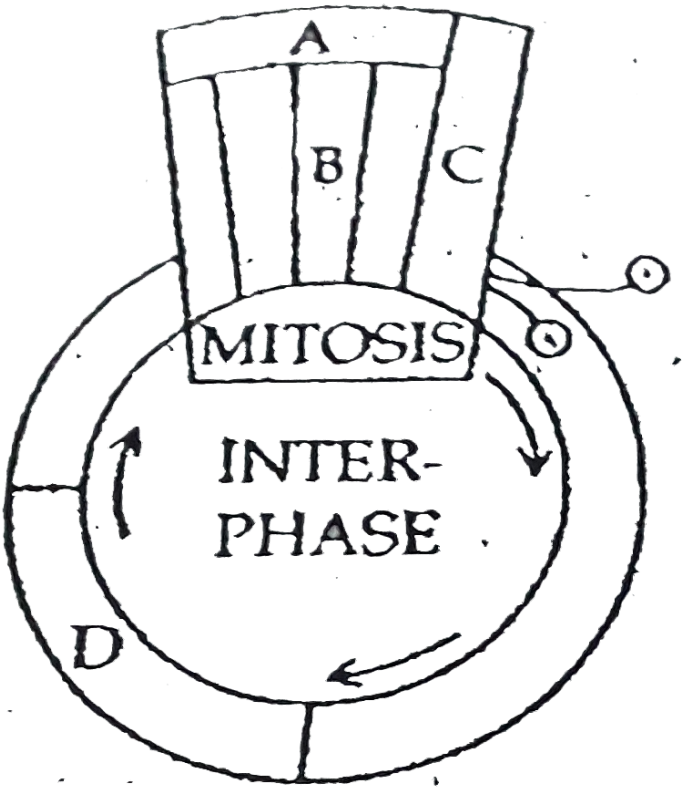
15. Given below is a schematic break-up of the phase stages of cell cycle :



A. B-metaphase

B. C-karyokinesis

C. D-synthetic phase

D. A-cytokinesis

Answer: C

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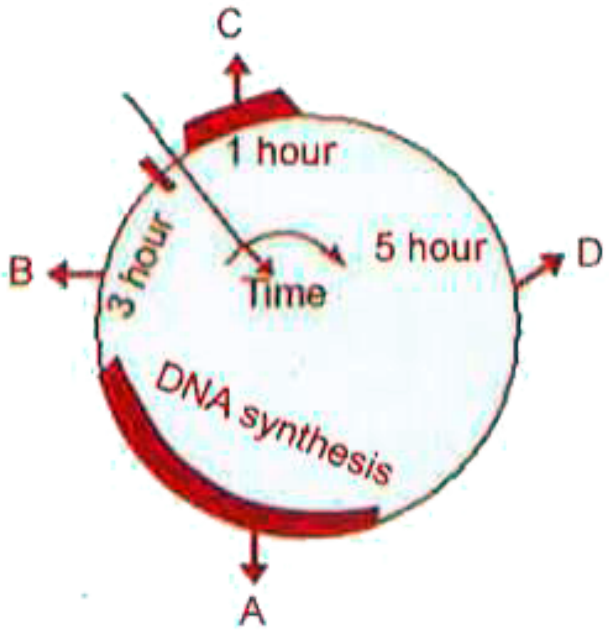
16. Given below is a schematic break up of the phases/stages of cell cycle which one of the following is the correct indication of the stage/phase in

the cell cycle



A. C-karyokinesis

B. D-synthetic phase

C. A-cytokinesis

D. B-metaphase

Answer: A

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17. Synapsis occurs between :-

A. mRNA and ribosomes

B. spindle fibres and centromere

C. two homologous chromosome

D. a male and a female gemeter

Answer: C

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18. (A) : The quiescent centre act as a reservoir of relatively resistant cells which constitute a permanent source of active initials.

(R): The cells of the inactive region of quiescent centre becomes active when the previous active initial get damaged

A. Both (A) and R are true and R is the correct explanation of (A)

B. Both (A) and R are true and R is not the correct explanation of (A)

C. (A) is true but R is false

D. Both (A) and (R) are false

Answer: A

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