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Set 4 – Cell Cycle and Cell Division

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1. During the cell cycle, checkpoints are essential for —
A) Speeding up cell division B) Ensuring DNA integrity and proper division C) Breaking down chromosomes D) Forming centrioles

2. The G_1/S checkpoint ensures —
A) Proper spindle formation B) DNA replication readiness C) Cytokinesis D) Chromosome alignment

3. The G_2/M checkpoint ensures —
A) Completion of DNA replication B) Cytokinesis C) Nuclear membrane breakdown D) Spindle fiber attachment

4. The spindle assembly checkpoint ensures —
A) Proper attachment of chromosomes to spindle B) DNA synthesis C) Chromosome replication D) Cytoplasmic division

5. A cell will not enter the M phase until —
A) DNA replication is complete B) Nucleolus disappears C) Cytokinesis occurs D) Centrioles divide

6. Cyclins are proteins that —
A) Control progression of cell cycle B) Digest DNA C) Form chromosomes D) Help cytokinesis

7. Cyclin-dependent kinases (CDKs) are activated when bound to —
A) Cyclins B) RNA polymerase C) Histones D) DNA polymerase

8. The enzyme responsible for DNA replication is —
A) RNA polymerase B) DNA polymerase C) DNA ligase D) Helicase

9. The enzyme topoisomerase functions to —
A) Join Okazaki fragments B) Relieve supercoiling of DNA C) Add nucleotides D) Proofread DNA

10. If a cell fails to pass G_1 checkpoint, it —
A) Enters S phase B) Enters G_0 phase C) Enters M phase D) Dies immediately

11. In which phase of mitosis does spindle fiber formation begin?
A) Prophase B) Metaphase C) Anaphase D) Telophase

12. If a cell is prevented from completing cytokinesis, the result is —
A) Binucleated cell B) Polyploid cell C) Haploid cell D) Apoptotic cell

13. The term “cytokinesis” was first used by —
A) Flemming B) Strasburger C) Boveri D) Sutton

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14. Mitosis ensures genetic stability because —
A) DNA replicates only once and divides equally B) Crossing over occurs C) Mutation occurs D) None

15. If the cell skips S phase, what will happen?
A) Chromosomes will not replicate B) Cell will have double chromosomes C) Cytokinesis will fail D) M phase will stop

16. Which event marks the end of prophase?
A) Disappearance of nuclear membrane B) Chromosome condensation C) Formation of spindle D) Separation of chromatids

17. The number of chromosomes at metaphase I in a human cell is —
A) 23 bivalents B) 46 chromosomes C) 92 chromatids D) Both A and C

18. During meiosis, recombination nodules are seen in —
A) Pachytene B) Diplotene C) Diakinesis D) Zygotene

19. The synaptonemal complex is absent in —
A) Leptotene B) Pachytene C) Diplotene D) Zygotene

20. Chiasmata appear in —
A) Diplotene B) Pachytene C) Diakinesis D) Zygotene

21. At the end of meiosis I, the number of chromosomes is —
A) Haploid B) Diploid C) Tetraploid D) Triploid

22. Meiosis II resembles mitosis because —
A) Sister chromatids separate B) Chromosome number remains same C) Spindle formation occurs D) All of these

23. The major event of prophase I is —
A) Synapsis and crossing over B) Cytokinesis C) Nuclear envelope formation D) DNA replication

24. The function of kinetochore is —
A) Attachment of spindle fibers B) Formation of nucleolus C) DNA replication D) Crossing over

25. The term “bivalent” indicates —
A) Two homologous chromosomes B) Two sister chromatids C) Two nuclei D) Two spindle poles

26. The enzyme responsible for sealing nicks during DNA replication is —
A) DNA ligase B) DNA polymerase C) Helicase D) Primase

27. In meiosis I, the separation of homologous chromosomes ensures —
A) Reduction in chromosome number B) DNA replication C) Cytokinesis D) Spindle formation

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28. The function of the mitotic spindle is —
A) To distribute chromosomes evenly B) To form nuclear envelope C) To form nucleolus D) To initiate DNA replication

29. The duration of mitotic phase in a 24-hour cycle of human cell is —
A) 1 hour B) 5 hours C) 10 hours D) 20 hours

30. If the S phase is blocked, what will be the immediate effect?
A) No DNA replication B) No cell growth C) No spindle formation D) Nuclear envelope breakdown

31. Which of the following events does not occur during mitosis?
A) Synapsis B) Spindle formation C) Chromosome alignment D) Cytokinesis

32. Meiosis contributes to evolution because —
A) Crossing over introduces variation B) Mutation occurs during prophase C) DNA synthesis increases D) Cells double in number

33. A cell in which DNA content is doubled but chromosome number remains same is in —
A) S phase B) G_1 phase C) G_2 phase D) M phase

34. The spindle fibers are composed of —
A) Tubulin B) Actin C) Collagen D) Histone

35. Independent assortment occurs during —
A) Metaphase I B) Anaphase I C) Anaphase II D) Metaphase II

36. The phase of meiosis where centromere divides —
A) Anaphase II B) Anaphase I C) Metaphase I D) Telophase I

37. If the cell cycle is arrested at metaphase, the drug used could be —
A) Colchicine B) Penicillin C) Rifampicin D) Chloramphenicol

38. In mitosis, the spindle fiber originates from —
A) Centrosome B) Nucleus C) Golgi body D) Ribosome

39. If meiosis fails during gamete formation, the resulting gametes will be —
A) Diploid B) Haploid C) Polyploid D) Aneuploid

40. In which phase of mitosis are chromosomes aligned at the equator?
A) Metaphase B) Anaphase C) Prophase D) Telophase

41. The nuclear envelope reforms in —
A) Telophase B) Prophase C) Anaphase D) Metaphase

42. During cytokinesis in plant cells, the cell plate originates from —
A) Golgi vesicles B) Lysosomes C) Nucleolus D) Centrioles

43. Chromosome number doubles during —
A) S phase B) G_1 phase C) G_2 phase D) None

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44. The major difference between mitosis and meiosis I is —
A) Pairing of homologous chromosomes in meiosis I B) Crossing over in mitosis C) Formation of 2 cells in meiosis D) None

45. The phase in which homologous chromosomes pair is —
A) Zygotene B) Leptotene C) Pachytene D) Diplotene

46. The point of attachment of sister chromatids is —
A) Centromere B) Chromonema C) Chiasma D) Spindle

47. The total number of DNA molecules in a diploid cell (2n = 8) at G_2 phase will be —
A) 16 B) 8 C) 4 D) 32

48. The microtubule-organizing center in animal cell is —
A) Centrosome B) Centromere C) Spindle D) Chromosome

49. The region of the chromosome responsible for movement during cell division is —
A) Centromere B) Chromatid C) Telomere D) Nucleosome

50. Meiosis ensures that —
A) Chromosome number remains constant in species B) Chromosome number doubles C) Genetic information changes completely D) Cell division stops

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✅ Answer Key (Set 4)

1-B, 2-B, 3-A, 4-A, 5-A, 6-A, 7-A, 8-B, 9-B, 10-B,
11-A, 12-A, 13-B, 14-A, 15-A, 16-A, 17-D, 18-A, 19-C, 20-A,
21-A, 22-D, 23-A, 24-A, 25-A, 26-A, 27-A, 28-A, 29-A, 30-A,
31-A, 32-A, 33-A, 34-A, 35-A, 36-A, 37-A, 38-A, 39-A, 40-A,
41-A, 42-A, 43-A, 44-A, 45-A, 46-A, 47-A, 48-A, 49-A, 50-A.