BIOLOGY

CLASS-XI NEET

MODULE-02

Cell Cycle & Cell Division

| Structural Organisation in Animals |Cell Unit of Life |
Transport in plants| Biomolecules |

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Topic-wise Questions

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Cell Cycle

1. The sequence of events in which a cell duplicates its genome, synthesises the other constituents of the cell and eventually divides into two daughter cells is called
a. Cell division
b. Cell cycle
c. Karyokinesis
d. Cytokinesis

2. A typical eukaryotic cell cycle is illustrated by
a. Yeast
b. Bacteria
c. Human cells in culture
d. Both (a) and (c)

3. In the 24 hour average duration of cell cycle of a human cell, cell division properly lasts for about
a. 23 hours
b. An hour
c. Half an hour
d. 90 minutes

4. Of the total duration of cell cycle, the interphase lasts for more than
a. 95%
b. 5%
c. 90%
d. 80%

5. If a cell possesses twice as much DNA as in the functional cell, the cell
a. Is preparing to divide
b. Has completed division
c. Has ceased to function
d. Has reached end of its life span

6. Cell division is
a. A process that does not involve co-ordination of various cellular elements
b. A process that can occur at any time
c. A highly co-ordinated process
d. Never precise

7. Astral rays arise from
a. Centriole
b. Cytoplasm
c. Chromatid
d. Centromere

8. Most of the organelle duplication occurs during
a. M-phase
b. Interphase
c. Interkinesis
d. Cytokinesis

9. Which one among the following is correct?
a. DNA content becomes double during G_1-phase
b. Duration of interphase is short as compared to M-phase
c. G_2-phase follows mitotic phase
d. DNA-replication occurs in S-phase

10. Cell lineage "all cells are derived from pre - existing cells" is the famous generalisation of:
a. Lamarck
b. Schleiden
c. Schwann
d. Virchow

11. Cell division is a normal process in organisms, but sudden and rapid mitosis of cells in an organ may result into
a. New organ
b. Gastrula
c. Zygote
d. Cancer

12. Which of the following does not occur during cell division?
a. DNA replication
b. Cell growth
c. Increase in cytoplasm of daughter cell
d. Division of cell organelles

13. How many times does DNA replicate?
a. Twice in each cell cycle
b. Only once in each cell cycle
c. Once in mitotic cell cycle, once in meiotic-I (reductional division) and once in meiotic-II (equational division)
d. None of the above

14. Who stated that new cells develop from pre-existing cells?
a. Lamarck
b. Virchow
c. Prevost and Dumas
d. Strasburger

15. Amitosis is the characteristic of
a. Higher plants
b. Higher animals
c. Bryophyta
d. Lower organisms

Phases of Cell Cycle

16. Which phase corresponds to the interval between mitosis and initiation of DNA replication?
a. Gap 1/G_1 phase
b. Gap 2/G_2 phase
c. Synthesis/S phase
d. M phase

17. G_0 stage of cell denotes
a. Exit of cell from cell cycle
b. Check point before entering next phase
c. Death of cell
d. Temporary pause/suspended cell cycle

18. G_1, S and G_2 are stages of
a. Interphase
b. Prophase
c. Metaphase
d. Anaphase

19. Phase of cell cycle when DNA polymerase is active
a. G_1 b. S
c. G_2 d. M

20. "Post-mitotic phase" of the cell in which active synthesis of RNA and proteins takes place is
a. S-phase b. Amitotic phase
c. G_2-phase d. G_1-phase

21. If the initial amount of DNA is denoted as 2C then the amount of DNA after S-phase will be:
a. 4C b. 6C
c. C d. 2C

22. Which one is stored in G_1- phase?
a. ATP b. Tubulin
c. Histone d. All the above

23. Nucleolus, Golgi apparatus, ER reform in
a. Anaphase b. Prophase
c. Telophase d. Metaphase

24. Most cytogenic activities occur during
a. Interphase b. Telophase
c. Prophase d. Anaphase

25. A cell is bound to divide, if it has entered
a. G_2 - phase b. G_1 - phase
c. Prophase d. S -phase

26. The correct sequence of cell cycle is
a. S, G_1, G_2, M b. S, M, G_1, G_2
c. G_1, S, G_2, M d. M, G_1, G_2, S

27. Chromosomes are least condensed during:
a. Telophase b. Metaphase
c. Interphase d. Anaphase

28. Mature nerve cells cannot undergo cell division. These cells are probably considered in
a. G_2 - phase b. S - phase
c. Mitosis d. G_0 - phase

29. During cell cycle, RNA and protein synthesis takes place in
a. G_1 phase b. S - phase
c. M - phase d. Cytokinesis

30. Interphase in also known as _____ stage and it takes about _____% time of cell cycle:
a. Dividing, 95% b. Dividing, 80%
c. Resting, 95% d. Resting, 80%

31. Decision of G_0- phase occurs
a. Towards the end of G_1- phase
b. Before the G_1- phase
c. At the end of telophase
d. Towards the end of cytokinesis

32. How many of the following events, belong to S-phase of cell cycle?
A. Doubling of amount of DNA per cell
B. Initiation of DNA replication
C. Division of centrioles
D. Synthesis of proteins for cell division
a. None b. One
c. Two d. Three

33. G_2 phase is also called
a. Post-mitotic gap phase
b. Synthetic phase
c. Pre-mitotic gap phase
d. Only division

34. Which pair of body cells lack cell division?
a. Skin epithelial cells and nephrons
b. Nephrons and endothelial cells
c. Gut lining cell and neurons
d. Neurons and heart cells

35. The stage between 2 M-phase is:
a. G_1-phase b. S-phase
c. G_2-phase d. Interkinesis

M Phase

36. End of prophase is marked by
a. Complete disintegration of nuclear membrane
b. Disappearance of ER, GB, nucleolus and nuclear envelope
c. Initiation of condensation of chromosomal material
d. Chromosomes align at the equatorial plate

37. The completion of prophase can be marked by
a. Chromosomal material condenses to form compact mitotic chromosomes
b. Initiation of condensation of chromosomal material
c. Initiation of the assembly of mitotic spindle
d. Both (a) and (c)

38. Which of the protein is found in spindle fibre?
a. Tubulin b. Albumin
c. Mucin d. Haemoglobulin

39. Chromosome number can be doubled by using which of the following?
a. IAA b. GA
c. Zeatin d. Colchicine

40. The centriole begins to move towards opposite poles of the cell in
a. Prophase b. Metaphase
c. Anaphase d. Telophase

41. By this stage, condensation of chromosomes is completed, mark this stage
a. Prophase b. Metaphase
c. Anaphase d. Telophase

42. In mitosis, the chromosomal elongation starts, nucleolus and the nuclear membrane reappear. This essential step happens in:
a. Telophase b. Interphase
c. Metaphase d. S phase

43. Which of the following ions are necessary for assembly of microtubules?
a. Na^+ and K^+ b. Ca^{2+} and Cl^-
c. Ca^{2+} and Mg^{2+} d. Na^+ and Ca^{2+}

44. The plane of alignment of the chromosomes at metaphase is referred to as the
a. Metaphasic alignment
b. Chromosome alignment
c. Metaphase plate
d. All of the above

45. What is the significance of mitosis?
a. Growth b. Repair
c. Replacement d. All of the above

46. In which stage of cell division chromosomes are most condensed?
a. Prophase b. Metaphase
c. Anaphase d. Telophase

47. Which of the following serves as mitotic spindle poison?
a. Ca^{2+} b. Mg^{2+}
c. Tubulin d. Colchinine

48. Cyanide inhibits
a. Metaphase b. Prophase
c. Anaphase d. Telophase

49. In mitosis, centromere divides during
a. Prophase b. Metaphase
c. Anaphase d. Telophase

50. Which of the following cannot be considered as mitogen?
a. Cytokinin b. Insulin
c. Colchicine d. Auxin

51. How many generations of mitotic divisions are needed for a single cell to make 256 cells?
a. 8 b. 16
c. 32 d. 64

52. Chromosome exhibit high level of coiling at which phase of karyokinesis?
a. Prophase b. Metaphase
c. Telophase d. Interphase

53. Colchicine prevents the mitosis of cells at which of the following stage?
a. Anaphase b. Metaphase
c. Prophase d. Interphase

54. Karyokinesis differs from cytokinesis as it involves division of:
a. Cell b. Both nucleus and cytoplasm
c. Nucleus d. Cytoplasm

55. Phragmoplast is the precursor of
a. Chloroplast b. Chromoplast
c. Cell plate d. Leucoplast

56. Chromosome duplication without nuclear division refers to
a. Meiosis b. Mitosis
c. Androgenesis d. Endomitosis

57. What precedes reformation of nuclear envelope in M-phase?
a. Formation of contraction ring and transcription from chromosomes
b. Transcription of chromosomes and reassembly of nuclear lamina
c. Formation of phragmoplast and contraction ring
d. Decondensation of chromosomes and appearance of nuclear lamina

58. Centromere is required for
a. Movement of chromosomes towards poles
b. Cytoplasmic cleavage
c. Crossing over
d. Transcription

59. If one cell has twice as much DNA as another similar cell, it may be
a. Respiring b. Secreting
c. Dividing d. Moving

60. What is the full form of MTOCs?
a. Microtubule organ centres
b. Microtubule oxygen centres
c. Microtubules organizing centres
d. Microtubules oxytocin centres

61. 'XX' is a phase of mitosis, in which the chromatin condenses into discrete chromosomes. During 'XX' phase, nuclear envelope breaks down and spindles forms at opposite ends of the cell. Identify 'XX'
a. Interphase b. Anaphase
c. Telophase d. Prophase

62. Reason of chromosomal movement in Anaphase
a. Astral rays
b. Centrioles
c. Kinetochore
d. Kinetochore and spindle fibres

63. A human bone marrow cell, in prophase of mitosis, contains 46 chromosomes. How many chromatids does it contain altogether?

a. 46
b. 92
c. 23
d. 23 or 46, depending when during prophase you look

64. Which one is not a mitogen?

a. Epidermal growth factor
b. Platelet derived growth factor
c. Lymphokine
d. None of the above

65. The absence of centrioles from higher plant cells means that during somatic cell nuclear division, there is:

a. No apparent organiser of mitotic spindles.
b. No equatorial arrangement of chromosomes at metaphase.
c. No new cell wall laid down at telophase.
d. No spindle formed.

Significance of Mitosis

66. A very significant contribution of mitosis is cell repair. Repairing takes place in our body in

a. Blood cells
b. Upper layer of epidermis
c. Cells of the lining of the gut
d. All of the above

67. The growth of multicellular organisms is due to

a. Meiosis I
b. Mitosis
c. Meiosis II
d. Both (a) and (c)

68. What type of cell division occurs in the cells of the upper layer of the epidermis, cells of the lining of the gut, and blood cells?

a. Mitosis
b. Meiosis I
c. Meiosis II
d. Both (b) and (c)

69. Significance of mitosis involves

a. The growth of multicellular organism.
b. Cell repair.
c. Production of diploid daughter cells with identical genetic complement.
d. All of the above

70. Mitosis results in the production of

a. Genetically identical daughter cells
b. Two diploid daughter cells
c. Genetically different daughter cells
d. Both (a) and (b)

Meiosis

71. When synapsis is complete all along the chromosomes, the cell is said to have entered a stage called:

a. Diakinesis
b. Pachytene
c. Diplotene
d. Zygotene

72. Prophase-I is subdivided into five phases based on

a. Chromosomal movement
b. Chromosomal alignment
c. Chromosomal behaviour
d. Chromosomal structure

73. Shape of chiasmata is

a. C-shaped
b. X-shaped
c. Y-shaped
d. U-shaped

74. Tetrad is made up of:

a. Four homologous chromosomes with four chromatids
b. Four non-homologous chromosomes
c. Four non-homologous chromatids
d. Two homologous chromosomes, each with two chromatids

75. Electron micrographs of which stage indicate that chromosomes accompanied by the formation of complex structure called synaptonemal complex?

a. Zygotene
b. Pachytene
c. Diplotene
d. Diakinesis

76. The stages through which a cell passes from one division to the next is called

a. Cell division
b. Cell cycle
c. Karyokinesis
d. Cytokinesis

77. Recognise the figure and find out the correct matching.

(A) (B) (C)

a. A—Early prophase, B—late prophase, C—transition to metaphase
b. B—Early prophase, A—late prophase, A—transition to metaphase
c. C—Early prophase, A—late prophase, B—transition to metaphase
d. B—Early prophase, A—late prophase, C—transition to metaphase

78. The four daughter cells produced at the end of meiosis are:

a. Genetically similar
b. Genetically dissimilar
c. Polynucleate
d. Anucleate

79. Non-sister chromatids exchange segments during
a. Leptotene b. Diplotene
c. Zygotene d. Pachytene

80. Which is unique to mitosis and does not occur in meiosis?
a. Homologous chromosomes cross over
b. Homologous chromosomes pair and form bivalent
c. Homologous chromosomes behave independently
d. Chromatids are separated during anaphase

81. Microtubules from opposite poles of spindle get attached to kinetochores of sister chromatids during
a. Anaphase II b. Prophase II
c. Metaphase II d. Metaphase I

82. In meiosis, synapsis occurs during
a. S-phase b. Interphase
c. Leptotene d. Prophase I

83. Meiosis involves
a. Two nuclear divisions and one chromosomal division
b. One nuclear division and one chromosomal division
c. One nuclear division and two chromosomal division
d. Two nuclear division and two chromosomal divisions

84. In which stage, synaptonemal complex dissolves
a. Zygotene b. Pachytene
c. Diplotene d. Diakinesis

85. At what stage, does the number of chromosomes become half?
a. Prophase I b. Metaphase I
c. Anaphase I d. Telophase I

86. Poleward movement of dyads occurs during
a. Anaphase b. Anaphase I
c. Anaphase II d. Telophase

87. In which stage, the chromosomes appear thin and long thread-like?
a. Zygotene b. Leptotene
c. Pachytene d. Prophase

88. When are chromatids/chromosomes clearly visible in meiosis?
a. Zygotene b. Diplotene
c. Pachytene d. Diakinesis

89. Histone protein synthesis occurs during
a. G_1-phase b. G_2-phase
c. S-phase d. Prophase

90. The term meiosis was coined by
a. Farmer and Moore b. Flemming
c. Blackman d. Robertson

91. Which of the following cellular structures always disappears during mitosis and meiosis?
a. Plastid and nuclear membrane
b. Nucleolus and nuclear membrane
c. Endoplasmic reticulum and mitochondria
d. Endoplasmic reticulum and plasma membrane

92. Crossing over results in
a. Segregation of alleles
b. Dominance of alleles
c. Recombination of linked alleles
d. Linkage between genes

93. Second division of meiosis is
a. Reductional division b. Multiplied division
c. Equational division d. None of the above

94. Spindle fibres arise from
a. Centriole b. Centromere
c. Nucleus d. Mitochondria

95. Number of generations of mitotic divisions required to produce 128 cells from a single cell is
a. 7 b. 14
c. 16 d. 32

96. Meiosis is evolutionary significant because it results in
a. Genetically similar daughters
b. Four daughter cells
c. Eggs and sperms
d. Recombinations

97. Zygotic meiosis occurs in
a. *Pinus* b. *Marchantia*
c. *Chlamydomonas* d. *Dryopteris*

98. Segregation of Mendelian factors (Aa) occurs during
a. Diplotene b. Anaphase I
c. Zygotene/Pachytene d. Anaphase II

99. Gap between meiosis-I and meiosis-II is called
a. Interphase b. Interkinesis
c. Diakinesis d. Metakinesis

100. Slipping of chiasmata towards the ends of bivalent is called
a. Terminalisation b. Diakinesis
c. Interkinesis d. Heteropycnosis

101. After meiosis -I, the two chromatids of a chromosome are
a. Genetically similar
b. Genetically different
c. There occurs only one chromatid in each chromosome
d. None of the above

102. Among the following which one is longest phase in prophase of meiosis?

a. Leptotene b. Zygotene

c. Pachytene d. Diplotene

103. "Bouquet-stage" occur in which substage of prophase I?

a. Leptotene b. Zygotene

c. Pachytene d. Diplotene

104. During pachytene stage of meiosis, the chromosomes appear

a. Single stranded b. Four stranded

c. Six stranded d. Eight stranded

105. During the first metaphase of meiosis, the centromeres

a. Undergo division

b. Do not divide

c. Divide but do not separate

d. Are not identical

106. Which of the following does not occurs in Anaphase I?

a. Segregation of homologous chromosomes

b. Contraction in spindle

c. Poleward movement of chromosomes

d. Division of centromere

107. When dividing cells are observed under a light microscope, chromososmes become visible in

a. Interphase b. S-phase

c. Prophase d. G_1-phase

108. A plant has number of chromosome group arranges at equatorial plane of metaphase-I whose 2n = 50; the number of chromosomes visible will be

a. 100 b. 25

c. 50 d. 75

109. The homologous chromosomes separate, while sister chromatid remain associated at their centromeres at

a. Metaphase-I of meiosis b. Anaphase-I of meiosis

c. Metaphase of mitosis d. Anaphase of mitosis

Significance of Meiosis

110. Meiotic cell division is also termed as reduction division because of

a. Involvement of gametes

b. Doubling of chromosomes

c. Elimination of chromosomes

d. Number of chromosomes become halved

111. Which one ensures maintenance of chromosome number generation after generation?

a. Mitosis b. Meiosis

c. Splicing d. Metamorphosis

112. Genetic recombination is due to

a. Fertilisation and meiosis

b. Mitosis and meiosis

c. Fertilisation and mitosis

d. None of the above

113. 'X' ensures the production of 'Y' phase in the life cycle of sexually reproducing organisms whereas fertilization restores the 'Z' phase. Identify X, Y and Z.

a. X- Mitosis, Y - haploid, Z - haploid

b. X- Mitosis, Y - diploid, Z - diploid

c. X- Meiosis, Y - haploid, Z - diploid

d. X- Meiosis, Y - diploid, Z – diploid

114. Choose the mismatch pair.

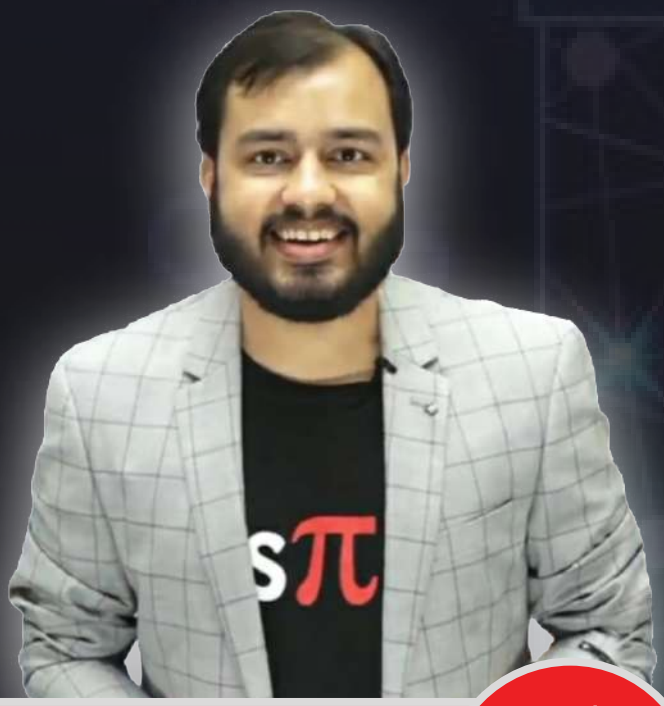
a. Karyokinesis – Division of centromere

b. Cytokinesis – Division of cytoplasm

c. S-phase – DNA synthesis

d. Synapsis – Pairing of homologous chromosomes

ABOUT PHYSICS WALLAH



Alakh Pandey is one of the most renowned faculty in NEET & JEE domain's Physics. On his YouTube channel, Physics Wallah, he teaches the Science courses of 11th and 12th standard to the students aiming to appear for the engineering and medical entrance exams.

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