Chapter 04

Cell Cycle and Cell Division

NEET-FLASHBACK

Q.1 A stage in cell division is shown in the figure. Select the answer which gives correct identification of the stage with its characteristics: **[NEET-2013]**

a	Telophase	Endoplasmic reticulum and nucleolus not reformed yet.
b	Telophase	Nuclear envelope reforms, Golgi complex reforms.
c	Late Anaphase	Chromosomes move away from equatorial plate, Golgi complex not present.
d	Cytokinesis	Cell plate formed, mitochondria distributed between two daughter cells.

Q.2 The complex formed by a pair of synapsed homologous chromosomes is called: **[NEET-2013]**

(1) Axoneme (2) Equatorial plate

(3) Kinetochores (4) Bivalent

Q.3 In 'S' phase of the cell cycle: **[AIPMT-2014]**

(1) Amount of DNA is reduced to half in each cell

(2) Amount of DNA doubles in each cell

(3) Amount of DNA remains same in each cell

(4) Chromosome number is increased

Q.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? **[AIPMT-2014]**

(1) G_2 and M (2) G_0 and G_1

(3) G_1 and S (4) Only G_2

Q.5 The enzyme recombinase is required at which stage of meiosis? **[AIPMT-2014]**

(1) Diakinesis (2) Pachytene

(3) Zygotene (4) Diplotene

Q.6 Arrange the following events of meiosis in correct sequence: **[AIPMT-2015]**

A. Crossing over

B. Synapsis

C. Terminalisation of chiasmata

D. Disappearance of nucleolus

(1) (B), (A), (C), (D) (2) (A), (B), (C), (D)

(3) (B), (C), (D), (A) (4) (B), (A), (D), (C)

Q.7 A somatic cell that has just completed the S phase of its cell cycle, as compared to gamete of the same species, has: **[AIPMT-2015]**

(1) Twice the number of chromosomes and four times the amount of DNA

(2) Four times the number of chromosomes and twice the amount of DNA

(3) Twice the number of chromosomes and twice the amount of DNA

(4) Same number of chromosomes but twice the amount of DNA

Q. 8 Select the correct option: **[2015 Re]**

Column I		Column II	
A	Synapsis aligns the Homologous chromosomes	i	Anaphase-II
B	Synthesis of RNA and Protein	ii	Zygotene
C	Action of enzyme Recombinase	iii	G_2-phase
D	Centromeres do not separate but chromatids move towards opposite poles	iv	Anaphase-I
		v	Pachytene

(1) A-i B-ii C-iii D-iv (2) A-ii B-iii C-iv D-v
(3) A-ii B-i C-iii D-iv (4) A-ii B-iii C-v D-iv

Q.9 In meiosis, crossing over is initiated at: **[NEET-2016 – I]**

(1) Pachytene (2) Leptotene
(3) Zygotene (4) Diplotene

Q.10 Which of the following is not a characteristic feature during mitosis in somatic cells? **[NEET-2016 – I]**

(1) Spindle fibres
(2) Disappearance of nucleolus
(3) Chromosome movement
(4) Synapsis

Q.11 During cell growth, DNA synthesis takes place in: **[NEET-2016 – II]**

(1) G_2 phase (2) M phase
(3) S phase (4) G_1 phase

Q.12 When cell has stopped DNA replication fork, which checkpoint should be predominantly activated? **[NEET-2016 – II]**

(1) M (2) Both G_2/M and M
(3) G_1/S (4) G_2/M

Q.13 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: **[NEET-2016 – II]**

Column I		Column II	
A	Pachytene	i	Pairing of homologous Chromosomes
B	Metaphase	ii	Terminalisation of chiasmata
C	Diakinesis	iii	Crossing over takes place
D	Zygotene	iv	Chromosomes align at equatorial plate

(1) A-iii, B-iv, C-ii, D-i
(2) A-i, B-iv, C-ii, D-iii
(3) A-ii, B-iv, C-iii, D-i
(4) A-iv, B-iii, C-ii, D-i

Q.14 At what phase of meiosis homologous chromosomes are separated? **[2017-Gujarat]**

(1) Anaphase II (2) Prophase I
(3) Prophase II (4) Anaphase I

Q.15 Which of the following statements is correct with respect to cell cycle? **[2017-Gujarat]**

(1) DNA content of cell remains constant during entire cell cycle
(2) A cell in G_1 phase has double the amount of DNA than a cell in G_2 phase
(3) Each chromosome has two chromatids in G_1 phase
(4) Nerve cells in adult human are in G_0 state

Q.16 DNA replication in bacteria occurs: **[2017-Delhi]**

(1) During S-phase
(2) Within nucleolus
(3) Prior to fission
(4) Just before transcription

Q.17 Anaphase promoting complex (APC) is a protein degradation machinery necessary for proper

mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur? **[2017-Delhi]**

(1) Chromosomes will not condense

(2) Chromosomes will be fragmented

(3) Chromosomes will not segregate

(4) Recombination of chromosome arms will occur

Q.18 Which of the following options gives the correct sequence of events during mitosis? **[2017-Delhi]**

(1) Condensation → Nuclear membrane disassembly → Crossing over → Segregation → Telophase

(2) Condensation → Nuclear membrane disassembly→ Arrangement at equator → Centromere division → Segregation → Telophase

(3) Condensation → Crossing over → Nuclear membrane disassembly → Segregation → Telophase

(4) Condensation → Arrangement at equator → Centromere division → Segregation → Telophase

Q.19 The stage during which separation of the paired homologous chromosomes begins is **[NEET-2018]**

(1) Pachytene (2) Diplotene

(3) Diakinesis (4) Zygotene

Q.20 Cell in G_0 phase **[NEET-2019]**

(1) Exit the cell cycle

(2) Enter the cell cycle

(3) Suspend the cell cycle

(4) Terminate the cell cycle

Q.21 The correct sequence of phases of cell cycle is **[NEET-2019]**

(1) $M \rightarrow G_1 \rightarrow G_2 \rightarrow S$

(2) $G_1 \rightarrow G_2 \rightarrow S \rightarrow M$

(3) $S \rightarrow G_1 \rightarrow G_2 \rightarrow M$

(4) $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$

Q.22 Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G_0). This process occurs at the end of: **[NEET-2020]**

(1) G_1 phase (2) S phase

(3) G_2 phase (4) M phase

Q.23 Dissolution of the synaptonemal complex occurs during: **[NEET-2020]**

(1) Zygotene (2) Diplotene

(3) Leptotene (4) Pachytene

Q.24 Identify the correct statement with regard to G_1 phase (Gap 1) of interphase. **[NEET-2020]**

(1) Reorganisation of all cell components takes place.

(2) Cell is metabolically active, grows but does not replicate its DNA.

(3) Nuclear division takes place.

(4) DNA synthesis or replication takes place.

Q.25 Match the following with respect to meiosis: **[NEET-2020]**

Column – I		**Column – II**	
a	Zygotene	i	Terminalization
b	Pachytene	ii	Chiasmata
c	Diplotene	iii	Crossing over
d	Diakinesis	iv	Synapsis

Select the correct option from the following:

	(a)	(b)	(c)	(d)
(1)	(iv)	(iii)	(ii)	(i)
(2)	(i)	(ii)	(iv)	(iii)
(3)	(ii)	(iv)	(iii)	(i)
(4)	(iii)	(iv)	(i)	(ii)

Q.26 During Meiosis I, in which stage synapsis takes place? **[2020 Covid Re-NEET]**

(1) Zygotene (2) Diplotene

(3) Leptotene (4) Pachytene

Q.27 Match the following events that occur in their respective phases of cell cycle and select the correct option: **[2020 Covid Re-NEET]**

a	G_1 phase	i	Cell grows and organelle Duplication
b	S phase	ii	DNA replication and chromosome duplication
c	G_2 phase	iii	Cytoplasmic growth
d	Metaphase in M-phase	iv	Alignment of chromosomes

Options are:

	(a)	(b)	(c)	(d)
(1)	(iii)	(iv)	(i)	(ii)
(2)	(iv)	(i)	(ii)	(iii)
(3)	(i)	(ii)	(iii)	(iv)
(4)	(ii)	(iii)	(iv)	(i)

Q.28 Attachment of spindle fibers to kinetochores of chromosomes becomes evident in: **[2020 Covid Re-NEET]**

(1) Telophase (2) Prophase

(3) Metaphase (4) Anaphase

Q.29 In a cell cycle, the correct sequence of phases is **[2020 Covid Re-NEET]**

(1) G_1, S, G_2, M (2) M, G_1, G_2, S

(3) G_1, G_2, S, M (4) S, G_1, G_2, M

Q.30 Match List-I with List-II. **[2020 Covid Re-NEET]**

List - I		List - II	
(a)	S phase	(i)	Proteins are synthesized
(b)	G_2 phase	(ii)	Inactive phase
(c)	Quiescent stage	(iii)	Interval between mitosis and initiation of DNA replication
(d)	G_1 phase	(iv)	DNA replication

Choose the correct answer from the options given below.

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(i)	(iv)
(2)	(iv)	(ii)	(iii)	(i)
(3)	(iv)	(i)	(ii)	(iii)
(4)	(ii)	(iv)	(iii)	(i)

Q.31 The centriole undergoes duplication during :

(1) S-phase (2) Prophase

(3) Metaphase (4) G_2 phase

Q.32 Which of the following stages of meiosis involves division of centromere? **[NEET-2021]**

(1) Metaphase I (2) Metaphase II

(3) Anaphase II (4) Telophase II

Q.33 When the centromere is situated in the middle of two equal arms of chromosomes, the chromosome is referred as : **[NEET-2021]**

(1) Metacentric (2) Telocentric

(3) Sub-metacentric (4) Acrocentric

Q.34 Which one of the following never occurs during mitotic cell division? **[NEET-2022]**

(1) Spindle fibres attach to kinetochores of chromosomes

(2) Movement of centrioles towards opposite

(3) Pairing of homologous chromosomes

(4) Coiling and condensation of the chromatids

Q.35 Select the incorrect statement with reference to mitosis. **[NEET-2022]**

(1) All the chromosomes lie at the equator at metaphase

(2) Spindle fibres attach to centromere of chromosomes

(3) Chromosomes decondense at telophase.

(4) Splitting of centromere occurs at anaphase.

Q.36 The appearance of recombination nodules on homologous chromosomes during meiosis characterizes **[NEET-2022]**

(1) synaptonemal complex

(2) bivalent

(3) sites at which crossing over occurs

(4) terminalisation.

Q.37 Regarding meiosis. which of the statements is Incorrect? **[NEET-2022]**

(1) There are two stages in meiosis, meiosis -I and II

(2) DNA replication occurs in S phase of meiosis -II.

(3) Pairing of homologous chromosomes and recombination occurs m meiosis-I.

(4) Four haploid cells are formed at the end of meiosis – II

Q.38 The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis? **[NEET-2023]**

(1) Pachytene (2) Diplotene

(3) Diakinesis (4) Zygotene

Q.39 Select the correct statements. **[NEET-2023]**

A. Tetrad formation is seen during Leptotene.

B. During Anaphase, the centromeres split and chromatids separate.

C. Terminalization takes place during Pachytene.

D. Nucleolus, Golgi complex and ER are reformed during Telophase.

E. Crossing over takes place between sister chromatids of homologous chromosome. Choose the correct answer from the options given below:

(1) B and D only (2) A, C and E only

(3) B and E only (4) A and C only

Q.40 Given below are two statements: **[NEET-2023]**

Statement I : During G_0 phase of cell cycle, the cell is metabolically inactive.

Statement II : The centrosome undergoes duplication during S phase of interphase. In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct

Q.41 Which of the following stages of meiosis involves division of centromere? **[NEET-2023]**

(1) Metaphase II (2) Anaphase II

(3) Telophase (4) Metaphase I

Q.42 Among eukaryotes, replication of DNA takes place in : **[NEET-2023]**

(1) S phase (2) G_1 phase

(3) G_2 phase (4) M phase

Q.43 Match List I with List II : List I List II

A. M Phase	I. Proteins are synthesized
B. G_2 Phase	II. Inactive phase
C. Quiescent stage	III. Interval between mitosis and initiation of DNA replication
D. G_1 Phase	IV. Equational division

Choose the correct answer from the options given below : **[NEET-2023]**

(1) A-IV, B-II, C-I, D-III

(2) A-IV, B-I, C-II, D-III

(3) A-II, B-IV, C-I, D-III

(4) A-III, B-II, C-IV, D-I

ANSWER KEY

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Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	2	4	2	4	2	1	1	4	1	4	3	4	1	4	4
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	3	3	2	2	1	4	1	2	2	1	1	3	3	1	3
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43		
Ans.	1	3	1	3	2	3	2	1	1	3	2	1	2		