CELL CYCLE & CELL DIVISION

1. Prophase–I of meiotic division is typically longer and more complex, it is subdivided into five phases, on the basis of :-

(1) Staining

(2) Behaviour of chromosomes

(3) Duration

(4) Number of chromosomes

2. Match the columns :-

Column–I		Column–II	
A.	Leptotene	(i)	Compaction of chromosomes
B.	Zygotene		
C.	Pachytene	(ii)	Recombination nodule
D.	Diplotene		
E.	Diakinesis	(iii)	Synapsis
		(iv)	Terminalisation of chiasmata
		(v)	Dissolution of synaptonemal complex

(1) A–i, B–iii, C–ii, D–v, E–iv

(2) A–i, B–ii, C–iii, D–v, E–iv

(3) A–v, B–iii, C–ii, D–i, E–iv

(4) A–iii, B–ii, C–v, D–iv, E–i

3. Leptotene, zygotene, pachytene, diplotene and diakinesis are 5 phases of prophase–I. Which one is the longest in human oogenesis?

(1) Zygotene (2) Leptotene

(3) Diplotene (4) Diakinesis

4. Interkinesis is stage between :-

(1) Two mitotic divisions

(2) Two phases of meiotic divisions

(3) Anaphase and telophase

(4) Leptotene and zygotene

5. In which phase of mitosis, chromosomes loose their individuality ?

(1) Prophase (2) Metaphase

(3) Anaphase (4) Telophase

6. Mark incorrect statements :-

(A) Meiosis involves only a single cycle of DNA replication

(B) Four haploid cells are formed at the end of meiosis–I

(C) Mitosis may occurs in haploid and diploid cells

(D) In yeast, cell cycle takes about 90 minutes.

(1) A and B (2) A and C

(3) Only B (4) All are correct

7. It is significant to note that in the 24 hour average duration of cell cycle of human cell, cell division proper lasts for only about :-

(1) Four hours (2) 90 minutes

(3) An hour (4) 10 hours

8. In which stage of mitotic division, cells do not show Golgicomplex, ER, nucleolus and nuclear envelope ?

(1) Metaphase (2) Late prophase

(3) Anaphase (4) All of these

9. Karyotype of chromosomes is prepared at :-

(1) Prophase (2) Interphase

(3) Metaphase (4) Anaphase

10. In which phase of mitosis, cell does not have nucleolus ?

(1) Interphase (2) Telophase

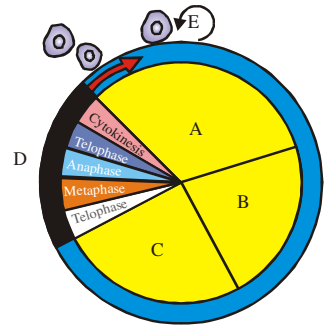
(3) Late prophase (4) All of these

11. "X-shaped structures" occurs during which phase of meiotic division ?

(1) Prophase I (2) Metaphase I

(3) Anaphase II (4) Telophase I

Q. No. 12 to 17 are based on given figure :



12. DNA replication occurs in ..... phase :-

(1) A (2) B (3) C (4) E

13. Which phase shows structured chromosomes ?

(1) B (2) D (3) C (4) E

14. Heart cells are found in ..... phase :-
(1) E (2) D (3) C (4) B

15. Quiescent stage is :-
(1) A (2) B (3) D (4) E

16. Centriole duplicates in ..... phase :-
(1) B (2) C (3) A (4) D

17. Cell differentiates in ..... phase :-
(1) C (2) E (3) B (4) D

18. In which stage of mitosis, Golgi complexes, ER, nucleolus and nuclear envelope begins to disappear?
(1) Early prophase (2) Late prophase
(3) Prometa phase (4) Metaphase

19. Chiasmata appear in which stage?
(1) Leptotene (2) Zygotene
(3) Pachytene (4) Diplotene

20. Which phase is marked by terminalization of chiasmata?
(1) Diakinesis (2) Pachytene
(3) Diplotene (4) Zygotene

21. Dissolution of synaptonemal complex is started and chiasmata are first seen during?
(1) Pachytene (2) Diplotene
(3) Diakinesis (4) Zygotene

22. Crossing over occurs during :-
(1) Pachytene (2) Diplotene
(3) Diakinesis (4) Zygotene

23. 'Dyad of cell' form after :
(1) Anaphase-I (2) Telophase-I
(3) Telophase-II (4) Anaphase-II

24. The movement of homologous chromosomes towards opposite poles occur by shortening of spindle fibre during :-
(1) Anaphase-II (2) Anaphase-I
(3) Telophase (4) Metaphase-I

25. In human being which cell(s) do/does not show division?
(a) Heart cell
(b) Muscle cell
(c) Nerve cell
(1) only a (2) only a and b
(3) only a and c (4) a, b and c

26. Cell cycle involves -
(1) Duplication of genome
(2) Synthesis of cell constituents
(3) Division of cell
(4) All the above

27. Regarding to cell cycle which of the following statement is wrong ?
(1) Cytoplasm increase is a continuous process
(2) DNA synthesis occurs only during one specific stage
(3) replicated chromosomes distributed to daughter nuclei by complex series of events
(4) events for replicated chromosomes distribution are not under genetic control

28. Which of the following phase corresponds to interval between mitosis and initiation of DNA replication ?
(1) G_1 phase (2) G_2 phase
(3) S - phase (4) M - phase

29. If there are 16 chromosomes in each root cell of onion, then what will be the number of chromosome in G_1 phase and G_2 phase respectively -
(1) 32 & 16 (2) 16 & 32
(3) 16 & 16 (4) 32 & 32

30. About cell - cycle, which of the following statement is correct ?
(1) In G_o phase cells are metabolically inactive
(2) In G_o phase cells are metabolically active
(3) Diploid somatic cells of animals divide by only meiotic division
(4) In plants only haploid cells can show mitotic divisions

31. The most dramatic period of cycle, involving a major reorganisation of virtually all components of cell is -
(1) G_1 (2) S
(3) G_2 (4) M

32. Chromatin condensation and movement of duplicated centriole towards opposite pole can be observed during-
(1) Prophase (2) Metaphase
(3) Anaphase (4) Telophase

33. Which of the following organelles or components can be observed in cell even after completion of prophase?
(1) Golgi complex
(2) Endoplasmic reticulum
(3) Nucleolus
(4) Mitochondria

34. Regarding arrangement of chromosome on equator during metaphase, which of the following statements is incorrect ?

(1) Each chromatid remains connected by one spindle fiber from both poles

(2) Each chromosome remains connected by spindle fibres from both poles

(3) Spindle fibre remains attached on kinetochore of both chromatids

(4) Each chromosome remains connected at both poles by spindle fibres

35. During poleward movement of chromosomes in anaphase centromere (kinetochore) of each daughter chromosome facing towards -

(1) Pole

(2) Equatorial plate

(3) Lateral

(4) It is random , sometimes towards pole and sometimes towards equatorial plate

36. Match the following -

(a) Prophase	(I) Decondensation of chromosome
(b) Metaphase	(II) Division of centromere
(c) Anaphase	(III) Attachment of spindle fibres on kinetochores of chromosomes
(d) Telophase	(IV) Initiation of assembly of mitotic spindles

(1) a (IV) b (III) c (I) d (II)

(2) a (IV) b (III) c (II) d (I)

(3) a (III) b (IV) c (II) d (I)

(4) a (III) b (IV) c (I) d (II)

37. Precursor of cell wall is -

(1) Cell membrane (2) Cell fragments

(3) Cell Plate (4) Nuclear membrane

38. Which of the following is not a significance of mitosis

(1) Maintenance of identical genetic complement

(2) Cell repair

(3) Restore nucleo cytoplasmic ratio

(4) Genetic variability

39. Meiosis ensures the production of ..... phase in life cycle of sexually reproducing organism, where as fertilisation restores ..... phase.

(1) diploid, haploid (2) haploid, triploid

(3) diploid, triploid (4) haploid, diploid

40. Meiosis involves two sequential cycles of nuclear and cell division called meiosis - I & meiosis - II, but how many cycles of DNA replication can be seen during this type of division ?

(1) One (2) Two (3) Three (4) Four

41. Regarding key features of meiosis select out the wrong one -

(1) Meiosis involves two sequential cycles of nuclear and cell division called meiosis- I & meiosis- II

(2) Meiosis is initiated after the parental chromosomes have replicated to produce identical sister chromatids at the S - Phase

(3) Meiosis involves pairing of homologous chromosomes and recombination between non homologous chromosome

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

42. Select the odd one -

(1) Zygotene - Synaptonemal complex appearance

(2) Pachytene - Appearance of recombination nodule

(3) Diplotene - Terminalisation of chiasmata

(4) Diakinesis - Assembly of meiotic spindle

43. Match the following -

(a) Metaphase- I	(I) Splitting of centromere of each chromosome
(b) Anaphase - I	(II) Separation of homologous chromosomes
(c) Telophase - I	(III) Alignment of bivalents on equatorial plate
(d) Anaphase -II	(IV) Appearance of diad of cells

	a	b	c	d
(1)	III	II	IV	I
(2)	II	III	IV	I
(3)	IV	III	II	I
(4)	I	II	III	IV

44. Match the following -

(a) Prophase- II	(I) Enclosure of chromosomes in nuclear envelope
(b) Metaphase - II	(II) Separation of sister chromatids
(c) Anaphase- II	(III) Chromosome alignment on equator
(d) Telophase -II	(IV) Disappearance of nuclear membrane

(1) a (IV) b (III) c (I) d (II)
(2) a (IV) b (III) c (II) d (I)
(3) a (IV) b (II) c (III) d (I)
(4) a (IV) b (I) c (II) d (III)

45. Which of the following is not a significance of meiosis ?
(1) Helps in conservation of specific chromosome number in each species
(2) Increase in genetic variability
(3) Helps in evolution and adaptation
(4) Helps in growth of organism

ANSWERS KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	**2**	**1**	**3**	**2**	**4**	**3**	**3**	**4**	**3**	**3**	**1**	**2**	**2**	**1**	**4**	**1**	**2**	**2**	**4**	**1**
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	**2**	**1**	**2**	**2**	**4**	**4**	**4**	**1**	**3**	**2**	**4**	**1**	**4**	**1**	**1**	**2**	**3**	**4**	**4**	**1**
Que.	41	42	43	44	45															
Ans.	**3**	**3**	**1**	**2**	**4**															