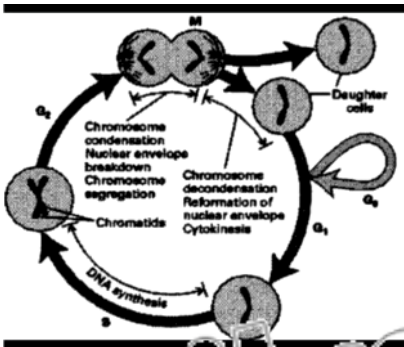

Chapter 21
Cell Cycle

TOPIC WISE MULTIPLE CHOICE QUESTIONS
INTERPHASE

KIPS MCQs

(1) Which one of the following event is included in cell cycle?
(a) Growth **(b)** Replication of DNA
(c) Cell division **(d) All of the above**

(2) The period between two consecutive cell divisions is termed as:
(a) G_1-phase **(b) Interphase**
(c) S-phase **(d)** G_2-phase

(3) What is the time for mitosis in an average cell cycle in the case of human cell?
(a) 24 Hours **(b)** 9 Hours
(c) 30 Minutes **(d)** 90 Minutes

(4) _____ phase precedes G_2 phase.
(a) G_1-phase **(b)** Interphase
(c) S-phase **(d)** Mitotic phase

(5) Cell cycle consists of two phases:
(a) Karyokinesis and cytokinesis **(b) Interphase and mitotic phase**
(c) Interphase and karyokinesis **(d)** All of the above

(6) G_0-phase remains for the lifetime of the organism without proliferating further. Point out those cells from the following list:
(a) Nerve cells **(b)** Skin cells
(c) Muscle cells **(d)** All of the above

(7) Which one is not the event of G2 phase?
(a) Energy storage for chromosome movement
(b) Synthesis of microtubules subunits
(c) Doubling of chromosome
(d) None of these

(8) In which phase of cell cycle the number of chromosomes become double?
(a) G_1-phase **(b)** G_0-phase
(c) S-phase **(d)** G_2-phase

(9) How much time is required for full cell cycle in yeast cells?
(a) 30 Minutes **(b)** 60 Minutes
(c) 90 Minutes **(d)** 120 Minutes

PAST PAPERS MCQs

(10) In the case of human cell, average cell cycle is about: (BWP 2017)
(a) 24 hours **(b)** 26 hours
(c) 28 hours **(d)** 30 hours

(11) In human cell, average cell cycle is about: (MTN 2017)
(a) 14 hours **(b) 24 hour**
(c) 34 hours **(d)** 44 hours

(12) In case of human cell, cell cycle is about: (SGD 2017)
(a) 21 hours **(b)** 22 hours
(c) 23 hours **(d) 24 hours**

(13) The period of life cycle of a cell between two consecutive divisions is: (RWP 2017)
(a) Prophase **(b)** Telophase
(c) Degree phase **(d) Interphase**

(14) A network of verifying threads called chromatin material can be visualized n cell during: (DGK 2017)
(a) Interphase **(b)** Metaphase
(c) Anaphase **(d)** Prophase

(15) Post mitotic cell can exit the cell cycle during which phase: (SGD 2018)
(a) G_o **(b) G_1**
(c) G_2 **(d)** S

(16) The average cell cycle in humans is: (LHR 2018)
(a) 12 hours **(b) 24 hours**
(c) 36 hours **(d)** 48 hours

(17) The interphase of meiosis laps the stage: (LHR 2018)
(a) G_o **(b)** G_1
(c) G_2 **(d)** S

(18) The full cell cycle in yeast cell is completed in: (MTN 2018)
(a) 24 hours **(b)** 4.5 hours
(c) 30 minutes **(d) 90 minutes**

(19) The full cell cycle takes 90 minutes in: (SWL 2019)
(a) Human **(b)** Yeast
(c) Bacteria **(d)** Angiosperms

(20) The S-phase of cell takes: (FSD 2021)
(a) 9 hours **(b)** 4.5 hours
(c) 1.30 hours **(d)** 10 hours

ENTRY TEST BASED MCQs

(21) Microtubule subunits (for spindle fibers) are synthesized in _____ phase. (UHS 2019)
(a) G_2 **(b)** S
(c) M **(d)** G_1

(22) Duringthe G2 phase: (UHS 2019)
(a) Specific enzymes are synthesized and DNA base units are accumulated.
(c) The chromosomes are left with only one chromatid
(b) Chromosomes number is duplicated.
(d) Energy is stored for Chromosome movement and mitotic specific proteins (Tubulin) are produced.

MITOSIS

KIPS MCQs

(23) Which is the true option for the biochemical structure of spindle fibers?
(a) Histones & DNA **(b)** Tubulin & DNA
(c) Microtubules subunits **(d) Microtubules & RNA**

(24) Which type of cell division may take place in haploid as well as in diploid cells?
(a) Mitosis **(b)** Meiosis
(c) Both a & b **(d)** None of these

(25) In what stage the centriole is duplicated?
(a) Prophase **(b)** Metaphase
(c) Anaphase **(d) Interphase**

(26) Which structure is not present in plant mitosis?
(a) Spindle **(b)** Mitotic apparatus
(c) Centriole **(d)** Both b and c

(27) What is the origin of microtubules (fibers) in dividing animal cells?
(a) Centromere **(b) Centrioles**
(c) Cytoplasm **(d)** Kinetochore

(28) The chromatin material gets condensed by folding and the chromosomes appear as thin threads at the beginning of prophase. The length of these thin fibre is:
(a) 0.01µm-0.20µm **(b)** 0.25µm-0.50µm
(c) 0.25µm-50µm **(d)** 25µm-50µm

(29) What types of proteins are present in contractile ring of cytokinesis?
(a) Histones **(b) Actin & Myosin**
(c) Tubulin **(d)** Histones & Tubulin

(30) In dividing plant cell the phragmoplast is the replacement of _____in animal cell.
(a) Equatorial plate **(b)** Metaphase plate
(c) Contractile ring **(d)** Mitotic apparatus

(31) Phragmoplast is formed from vesicles, which originate from:
(a) Endoplasmic Reticulum **(b) Golgi complex**
(c) Mitochondria **(d)** Lysosomes.

(32) Polar microtubules _____ during anaphase.
(a) Elongate **(b)** Contract
(c) Remain unchanged **(d)** Attach to kinetochore

(33) During cytokinesis the cell shape does not change in:
(a) Animal cell **(b) Plant cell**
(c) Both of these **(d)** None of these

(34) Separation of chromatids occur during _____ in mitosis.
(a) Prophase **(b)** Metaphase
(c) Anaphase **(d)** Telophase

(35) Which phase is the shortest one?
(a) Prophase **(b) Metaphase**
(c) Anaphase **(d)** Telophase

PAST PAPERS MCQs

(36) The most critical phase of mitosis is: (DGK 2017)
(a) Anaphase **(b)** Prophase
(c) Telophase **(d)** Metaphase

(37) During cell division the nuclear division is called: (SWL 2017)
(a) Karyokinesis **(b)** Cytokinesis
(c) Karyotype **(d)** Deplasmolysis

(38) The chromosomes appear as thin threads having length of: (MTN 2017)
(a) 0.25µm to 50µm **(b)** 2.5µm to 50µm
(c) 25µm to 50µm **(d)** 0.025µm to 50µm

(39) The division of whole cell is called: (GRW 2018)
(a) Karyokinesis **(b) Cytokinesis**
(c) Interphase **(d)** Kinetochore

(40) Phragmoplast is formed by vesicles originate from: (SWL 2018)
(a) Endoplasmic reticulum **(b) Golgi complex**
(c) Chloroplast **(d)** Mitochondria

(41) The microtubules are composed of traces of RNA and a protein. (LGK 2018)
(a) Actin **(b)** Myosin
(c) Tubulin **(d)** Actinin

(42) Which one is absent in animal cell? (DGK 2018)
(a) Spindle **(b)** Centriole
(c) Chromatids **(d) Phragmoplast**

(43) The tumor which is localized and not transferred to the other body parts: (FSD 2019)
(a) Malignant **(b)** Benign
(c) Apoptosis **(d)** Necrosis

(44) The chromatin material gets condensed by folding and chromosomes appear as thin thread in mitosis at the beginning of: (SWL 2019)
(a) Interphase **(b)** Prophase
(c) Metaphase **(d)** Anaphase

(45) The microtubes of spindle compound of protein: (FSD 2021)
(a) Actin **(b)** Myosin
(c) Globulin **(d) Tubulin**

(46) Contractile ring in cytokinesis is formed by: (SGD 2019, 2021)
(a) Tubulin **(b) Actin and Myosin**
(c) keratin **(d)** Cyclins

(47) The contraction of spindles occur during: (DGK 2022)
(a) Anaphase **(b)** Anaphase -1
(c) Metaphase **(d)** Both A and B

(48) The chromosomes may decondense during: (MTN 2022)
(a) Metaphase **(b) Telophase**
(c) Anaphase **(d)** Diplotene

IMPORTANCE OF MITOSIS & CANCER (UNCONTROLLED CELL DIVISION)

KIPS MCQs

(49) The spread of tumor cells and establishment of secondary areas of growth is called as:
(a) Metastasis **(b)** Epitasis
(c) Both a & b **(d)** None of these

(50) Some tumor are of small size and are localized having little deleterious effects, called:
(a) Malignant tumor **(b) Benign tumor**
(c) Metastasis **(d)** None of these

(51) Which fibers interdigitate during spindle formation?
(a) Polar fibers **(b)** Kinetochore fiber
(c) Astral fibers **(d)** Both a and b

(52) How many mutations may occur in genes that regulate the cell division to cause the cancer?
(a) 1-2 **(b) 3-20**
(c) 21-30 **(d)** 31-40

(53) What are the restrictions on cell movements?
(a) Basal lamina **(b)** Physical barriers
(c) Both a & b **(d)** None of these

PAST PAPERS MCQs

(54) The spread of tumour cells and establishment of secondary areas of growth is called: **(FSD 2017)**

(a) Epistasis **(b)** Prostasis
(c) Pleiotropy **(d) Metastasis**

(55) The presence of invading cells other than normal tissue is an indication of: **(LHR 2017)**

(a) Melatoma **(b)** Abnormality
(c) Mutation **(d) Malignancy**

(56) Cancer is caused mainly by mutation in: **(DGK 2017)**

(a) Germ cells **(b) Somatic cells**
(c) Epidermal cells **(d)** Reproductive cells

(57) The presence of invading cells other than normal tissue is an indication of: **(LHR 2017)**

(a) Melatoma **(b)** Abnormality
(c) Mutation **(d)** Malignancy

(58) Death of cells due to tissue damage is called: **(SWL 2017)**

(a) Apoptosis **(b)** Metastasis
(c) Cancer **(d) Necrosis**

(59) The tumor which is localized and not transferred to other parts of the body: **(FSD 2018)**

(a) Malignant **(b) Benign**
(c) Apoptosis **(d)** Necrosis

(60) The spread tumor cell and established of secondary areas growth is called: **(FSD 2021)**

(a) Metamorphosis **(b)** Cytostasis
(c) Espistasis **(d)** Metasasis

(61) To develop cancer, the number of mutations in genes regulates cell division is from: **(MTN 2022)**

(a) Ten **(b)** Thirty
(c) Twenty Five **(d)** Twenty

ENTRY TEST BASED MCQs

(62) The phase of mitosis in which sister chromatids move towards opposite poles: **(UHS 2013)**

(a) Prophase **(b)** Telophase
(c) Anaphase **(d)** Metaphase

MEIOSIS, IMPORTANCE OF MEIOSIS

KIPS MCQs

(63) Which kind of cell division involves two consecutive divisions after single replication of DNA?

(a) Mitosis **(b) Meiosis**
(c) Binary fission **(d)** Multiple fission

(64) Very prolonged phase of meiosis is:

(a) Prophase I **(b)** Anaphase I
(c) Prophase II **(d)** Telophase I

(65) In which one of the following stages, the process of crossing-over will take place?

(a) Leptotene **(b)** Zygotene

(c) Pachytene **(d)** Diplotene

(66) Chiasmata occur between the _____ chromatids.
(a) Sister chromatids
(b) Non-sister chromatids of homologous chromosomes
(c) None-sister chromatids of non-homologous chromosomes
(d) All of the above

(67) During _____ homologous chromosomes get close to each other.
(a) Leptotene **(b)** Zygotene
(c) Pachytene **(d)** Diplotene

(68) Mitotic apparatus is formed during _____ of cell division.
(a) Cytokinesis **(b)** Karyokinesis
(c) Interphase **(d)** Telophase

(69) Crossing over produces genetic variations necessary for:
(a) Mutation **(b)** Abnormalities
(c) Evolution **(d)** Non- disjunction

(70) During cell division the nuclear division is called:
(a) Karyokinesis **(b)** Cytokinesis
(c) Diakinesis **(d)** Plasmolysis

(71) Separation of homologous chromosomes occurs during:
(a) Metaphse I **(b) Diakinesis**
(c) Anaphase II **(d)** Metaphase II

(72) During Meiosis, homologous chromosomes come to pair with each other, this occurs in stage:
(a) Leptotene **(b) Zygotene**
(c) Pachytene **(d)** Diplotene

(73) Exchange of chromosomes segment due to chiasmata formation is called:
(a) Crossing over **(b)** Linkage
(c) Synapsis **(d)** None of these

PAST PAPERS MCQs

(74) Crossing over during meiosis occur at the stage of: (MTN 2017)
(a) Leptotene **(b)** Zygotene
(c) Diplotene **(d)** Pachytene

(75) Meiosis-II is just like the: (FSD 2017)
(a) Amitosis **(b) Mitosis**
(c) Regeneration **(d)** Replacement

(76) The condensation of chromosomes reaches to its maximum during: (LHR 2017)
(a) Diakinesis **(b)** Pachytene
(c) Zygotene **(d)** Leptotene

(77) The condensation of chromosomes reaches to its maximum during. (LHR 2017)
(a) Diakinesis **(b)** Pachytene
(c) Zygotene **(d)** Leptotene

(78) The stage of meiosis that last for days, weeks or even year is called: (FSD 2018)
(a) Leptotene **(b)** Zygotene
(c) Pachytene **(d)** Diplotene

(79) Meiosis is just like the: (MTN 2018)
(a) Amitosis **(b)** Regeneration
(c) Mitosis **(d)** Replacement

(80) The condensation of chromosomes reaches to its maximum during: (DGK 2018)
(a) Pachytene **(b)** Zygotene

(c) Diakinesis **(d)** Leptotene

(81) Each bivalent consists of four: **(BWP 2018)**
(a) Chromosomes **(b) Chromatids**
(c) Chiasmata **(d)** Spore

(82) Chiasmata formation takes place during: **(BWP 2018)**
(a) Leptotene **(b)** Diakinesis
(c) Pachytene **(d)** Diplotene

(83) The chromatids repel each other during: **(SWL 2019)**
(a) Zygotene **(b)** Pachytene
(c) Diplotene **(d)** Diakinesis

(84) The stage that lasts for days, weeks or even years: **(MTN 2019)**
(a) Leptotene **(b)** Zygotene
(c) Pachytene **(d)** Diplotene

(85) Pairing of Chromosomes is called as: **(BWP 2019)**
(a) Synapse **(b) Synapsis**
(c) Bivalent **(d)** Tetrad

(86) Crossing over occurs in: **(SWL 2019)**
(a) Leptotene **(b)** Zygotene
(c) Pachytene **(d)** Diplotene

(87) The leptotene and zygotene lasts for: **(BWP 2019)**
(a) Few hours **(b)** Few days
(c) Few weeks **(d)** Few years

(88) The paired chromosomes start to separate during: **(MTN 2021)**
(a) Diakinesis **(b)** Diplotene
(c) Pachytene **(d)** Zygotene

(89) The stage of meiosis that last for days, weeks or even year is called: **(FSD 2019)**
(a) Leptotene **(b)** Zygotene
(c) Pachytene **(d)** Diplotene

(90) A pairing of homologues chromosomes called synapsis, occur in: **(FSD 2021)**
(a) Leptotene **(b)** Diakinesis
(c) Zygotene **(d)** Pachytene

(91) Bivalents or tetrads are formed in: **(RWP 2021)**
(a) Leptons **(b)** Zygotene
(c) Pachytene **(d)** Diaknesis

(92) Pairing of homologous chromosomes is called: **(LHR 2022)**
(a) Bivalent **(b)** Tetrad
(c) Synapsis **(d)** Crossing over

(93) Synapsis takes place in: **(DGK 2017, DGK 2018, DGK 2022)**
(a) Leptotene **(b)** Pachytene
(c) Zygotene **(d)** Diplotene

(94) During pachytene: **(SWL 2022)**
(a) Pairing of homologous chromoses start **(b)** Pairing of homologous chromoses
(c) Paired chromoses start to separate **(d)** Separation of chromoses

(95) Chromosomal condensation reaches to its maximum during _____ phase. **(SGD 2022)**
(a) Zygotene **(b)** Pachytene
(c) Diplotene **(d)** Diakinesis

MEIOTIC ERRORS (NON-DISJUNCTION), NECROSIS & APOPTOSIS

KIPS MCQs

(96) Point out the monosomic condition from the following:
(a) Jacob's syndrome **(b) Turner syndrome**
(c) Down's syndrome **(d)** Klinefelter's syndrome

(97) Intracellular contents are released during the type of cell death called:
(a) Necrosis **(b)** Apoptosis
(c) Autophagy **(d)** None of these

(98) In Klinefelter's syndrome:
(a) One X chromosome missing **(b) Additional sex chromosome**
(c) Autosomes fail to segregate **(d)** None of these

(99) The number of chromosome in human cell during metaphase II is:
(a) 46 **(b)** 92
(c) 23 **(d)** None of these

(100) Mongolism is also known as:
(a) Turner's syndrome **(b)** Klinefelter's syndrome
(c) Down's syndrome **(d)** Jacob's syndrome

(101) Which character is common between Turner's syndrome and Klinefelter's syndrome person?
(a) Absence of germ cell **(b)** Small tests
(c) Webbed neck **(d)** Short statures.

(102) If mother's age is forty five years the risk of Down syndrome is:
(a) One in many thousands **(b)** One in hundred
(c) Three in hundred **(d)** Ten in hundred

(103) The chromosome number 44+X denotes:
(a) Turner's syndrome **(b)** Klinefelter's syndrome
(c) Down syndrome **(d)** Jacob's syndrome

(104) Cell death due to tissue damage is called:
(a) Necrosis **(b)** Apoptosis
(c) Autophagy **(d)** None of these

(105) What is the frequency of Births in the case of Edward syndrome?
(a) 1/700 **(b) 1/6000**
(c) 1/15000 **(d)** 1/1000

PAST PAPERS MCQs

(106) The sex chromosome of the person affected with Klinefelter's syndrome are: (RWP 2017)
(a) XYY **(b)** XXX
(c) XXY **(d)** XY

(107) Mongolism is also known as: (SGD 2017)
(a) Down's syndrome **(b)** Klinefelter's syndrome
(c) Turner's syndrome **(d)** Complement of Gene

(108) The affected individuals have one missing X-chromosome with only 45 chromosomes in: (LHR 2017)
(a) Down's syndrome **(b)** Sach's syndrome
(c) Turner's syndrome **(d)** Klinefelter's syndrome

(109) The frequency of occurrence of Down syndrome is: (GRW 2017)
(a) $\frac{1}{700}$ **(b)** $\frac{1}{40}$
(c) $\frac{1}{500}$ **(d)** $\frac{1}{200}$

(110) The autosomal non-disjunction in man in which 21st pair of chromosome fail to segregate resulting in gametes with 25 chromosome is: (SWL 2018)
(a) Down's syndrome **(b)** Turner's syndrome

(c) Klinefelter's syndrome **(d)** Jacob's syndrome

(111) The chances of teenage mother having Down's syndrome child is: (MTN 2018)
(a) One in Hundred **(b)** One in thousand
(c) 1 in many thousands **(d)** One in ten thousand

(112) Which of the following chromosomal abnormalities lead to tallness, aggressiveness, mental defect and antisocial behavior? (LHR 2018)
(a) XXY **(b)** XO
(c) XXXY **(d) XYY**

(113) The death of cell due to tissue damage is called: (LHR 2018)
(a) Necrosis **(b)** Phagocytosis
(c) Metastasis **(d)** Apoptosis

(114) Cell death due to tissue damage is called: (SGD 2018, MTN 2019)
(a) Apoptosis **(b)** Metastasis
(c) Necrosis **(d)** Suicide

(115) In turner syndrome the affected person have set of chromosomes: (RWP 2019)
(a) XO **(b)** XXY
(c) XYY **(d)** XXO

(116) Individuals having 45 chromosomes with one missing "X" chromosome are affected by: (MTN 2021)
(a) Down's syndrome **(b)** Klinefelter's syndrome
(c) Turner's syndrome **(d)** Edward's syndrome

(117) The syndrome in which male has enlarged breasts, obesity and small testes with no sperms is: (BWP 2021)
(a) Down's Syndrome **(b)** Turner's Syndrome
(c) Klineferter's Syndrome **(d)** Jacob's Syndrome

(118) Trisomy of chromosome 18 is found in: (SGD 2019, SGD 2021)
(a) Down's syndrome **(b)** Patau syndrome
(c) Edward syndrome **(d)** Jacob's syndrome

(119) Mongolism is also known as: (MTN 2018, RWP 2021)
(a) Down's syndrome **(b)** Kilnefelter's syndrome
(c) Turner's syndrome **(d)** Jacob's syndrome

(120) The syndrome having trisomy to chromosome 18 is called: (BWP 2022)
(a) Dawn's **(b)** Patau's
(c) Jacob's **(d)** Edward's

ENTRY TEST BASED MCQs

(121) Crossing over takes place during _____ of meiosis. (MDCAT 2018)
(a) Prophase I **(b)** Anaphase I
(c) Telophase I **(d)** Metaphase I

ANSWER KEY

(Topic Wise Multiple Choice Questions)

1	d	21	a	41	c	61		81	b	101	a	121	a
2	b	22	d	42	d	62	c	82	c	102	c		
3	c	23	d	43		63	b	83	c	103	a		
4	c	24	a	44		64	a	84	c	104	a		
5	b	25	d	45	d	65	c	85	b	105	b		
6	a	26	c	46	b	66	b	86	c	106	c		
7	c	27	b	47	a	67	a	87		107	a		
8	c	28	c	48	b	68	a	88		108	c		
9	c	29	b	49	a	69	c	89	c	109			
10	a	30	c	50	b	70	a	90	c	110	a		
11	b	31	b	51	a	71	b	91		111	c		
12	d	32	a	52	b	72	b	92	c	112	d		
13	d	33	b	53	c	73	b	93	c	113	a		
14	a	34	c	54	d	74	c	94		114	c		
15	b	35	b	55	d	75	b	95		115			
16	b	36	a	56	b	76	a	96	b	116			
17	c	37	a	57		77		97	a	117	c		
18	d	38	a	58	d	78	c	98	b	118			
19		39	b	59	b	79	c	99	c	119			
20		40	b	60		80	c	100	c	120			

INTERPHASE

KIPS QUESTIONS

Q:1 Define cell cycle and name the different stages.

Q:2 Cell Cycle: The cell undergoes a sequence of changes, which involves period of growth, replication of DNA, followed by cell division. This sequence of changes is called cell cycle.

Q:3 Stages: It comprises two phases' viz. interphase and mitotic phase.

Q:4 What do you mean by G0 phase?

Ans: It is phase of no growth, where some cells reside throughout life like nerve cells, cell of eye lens.

PAST PAPERS QUESTIONS

Q:5 Describe cell cycle. Give its two phases. **(GRW 2018)**

Q:6 Define cell cycle. Write its phases. **(MTN 2018)**

Q:7 What are the events of S-phase? **(RWP 2018)**

Q:8 Define cell cycle. Write its phases. **(SWL 2019)**

Q:9 Define cell cycle. **(MTN 2021)**

Q:10 Define cell cycle; write names of its phases. **(MTN 2021)**

Q:11 Calculative the length of human cell cycle. **(FSD 2021)**

MITOSIS

KIPS QUESTIONS

Q:12 What is the difference between Kinetochore and Centromere?

Ans:

Kinetochore	Centromere
It is the part of centromere having specific base sequences and proteins.	It is the part of chromosome for the attachment of chromatids. Also called primary constriction.
It provides attachment for kinetochore microtubules.	Holds the chromatids together.

Q:13 Why telophase of mitosis is considered opposite to prophase?

Ans: The events occur during telophase are actually opposite to prophase i.e.

- Nuclear membrane reappears
- Nucleolus reappears
- Chromosomes decondense due to unfolding
- Eventually chromosomes disappear as chromatin
- Mitotic apparatus disorganizes.

Q:14 What happens to kinetochore microtubules and Polar microtubules during cell division?

Ans: Kinetochore fibers contract while polar fibers elongate during cell division.

What is phragmoplast? Give its role in cell division.

Ans: Phragmoplast: Golgi vesicles that originate during metaphase, line up in the centre of the dividing cell, where they fuse to form phragmoplast.

Role: The membranes of vesicles become the plasma membrane of daughter cells. These vesicles also contain materials for future cell wall such as precursors of cellulose and pectin.

Q:15 Define cytokinesis and karyokinesis.

Ans: Cytokinesis:

Division of whole cell is called cytokinesis.

Karyokinesis:

Division of nucleus is called karyokinesis

Q:16 Explain cytokinesis in plants.

Ans: In cytokinesis plants do not form contractile ring. Instead a membrane structure **phragmoplast** is formed from vesicles. These vesicles are originated from Golgi complex during metaphase. The vesicles line up in the center of the dividing cell. They finally fuse to form phragmoplast at the end of telophase. The membrane of vesicles becomes the plasma membrane of daughter cells. These vesicles also contain materials for future cell wall. These materials are in form of precursors of cellulose and pectin.

PAST PAPER SHORT QUESTIONS

Q:17 What is mitotic apparatus and what is its role during cell division? **(DGK 2017)**
Q:18 List four important functions of mitosis. **(GRW 2017)**
Q:19 Write three importance of mitosis. **(DGK 2017)**
Q:20 Differentiate between cytokinesis and karyokinesis. **(DGK 2017)**
Q:21 What is the function of mitotic apparatus? **(RWP 2017)**
Q:22 Define meiosis and mitosis. **(LHR 2017)**
Q:23 Write down the functions of mitotic apparatus. **(LHR 2017)**
Q:24 What is a turner's syndrome, write briefly? **(LHR 2017)**
Q:25 What is a mitotic apparatus? **(LHR 2018)**
Q:26 How cytokinesis occurs in animals and plants. **(LHR 2018)**
Q:27 Give the significance of mitosis. **(DGK 2018)**
Q:28 How cytokinesis takes place in plant cell? **(DGK 2018)**
Q:29 What changes occur in cell during anaphase of mitosis? **(BWP 2018)**
Q:30 Write down the events of metaphase of mitosis. **(RWP 2018)**
Q:31 Differentiate between Karyokinesis and Cytokinesis. **(MTN 2019, SWL 2019)**
Q:32 What are the functions of mitotic apparatus? **(SGD 2019)**
Q:33 Define Mitosis. **(SWL 2019)**
Q:34 What are occur in cell during anaphase of mitosis? **(BWP 2021)**
Q:35 Compare kinetochore microbules and polar microtubules. **(FSD 2021)**
Q:36 What event occur in anaphase of mitosis? **(RWP 2021)**
Q:37 What is mitotic apparatus? **(LHR 2022)**
Q:38 Write down about anaphase. **(BWP 2022)**
Q:39 How mitosis is important with respect to development and growth? **(BWP 2022)**
Q:40 What are the function of mitotic apparatus? **(SGD 2022)**

IMPORTANCE OF MITOSIS & CANCER (UNCONTROLLED CELL DIVISION)

KIPS SHORT QUESTIONS

Q:41 How uncontrolled mitosis may be the main cause of some lethal diseases?

Ans: Cell division is so carefully regulated and responsive to specific needs of the body. If this occurs in uncontrolled fashion, an unwanted clone of cells, called tumor is formed. That may be benign or malignant and is a lethal disorder.

Q:42 What two basic changes are brought due to mutation in cancer cells?

Ans:

- Metastatic cells break their contact with other cells and overcome the restrictions on cell movement provided by basal lamina and other barrier.
- They proliferate unlimitedly without minding the checks of programs of the body.

Q:43 Differentiate between benign & malignant tumor.

Ans:

Benign Tumor	Malignant Tumor
They are localized.	They spread to other parts of body through metastasis.
Have less deleterious effects	More deleterious effect.
They are normal like cell.	The cells are less differentiated.

Q:44 What is the main indication of malignancy as regarding the behaviour of cells?

Ans: Presence of invading cells in normal tissue is an indication of malignancy.

PAST PAPERS QUESTIONS

Q:45 Define metastasis? How it occurs? **(SGD 2015)**

Q:46 What is metastasis? Give two properties of cancer cells. **(FSD 2016, 2018)**

Q:47 What is malignant tumor? **(SWL 2018)**

Q:48 What is the importance of mitosis? (any two) **(MTN, SWL 2018)**

Q:49 Differentiate between malignant and benign tumor. **(DGK 2019, DGK 2019, SWL 2019)**

Q:50 What is metastasis? **(DGK 2018, MTN 2019, FSD 2019, BWP 2021)**

Q:51 Differentiate between benign tumor and malignant tumor. **(FSD 2021)**

Q:52 How cancer cells can be distinguished from normal cells? **(LHR 2022)**

Q:53 How do cancer cells differ from normal cells? **(DGK 2022)**

Q:54 How can you identify the cancer cells? **(SGD 2022)**

MEIOSIS, IMPORTANCE OF MEIOSIS

KIPS QUESTIONS

Q:55 What do you mean by sister chromatids and how do they differ to that of non-sister chromatids?

Ans: The chromatids of the same chromosome are called sister chromatids. These chromatids are identical to each other while non sister chromatids are similar but not identical as they may have different alleles.

Q:56 What is the difference between anaphase of mitosis and meiosis I?

Ans:

Mitosis "Anaphase"	Meiosis "Anaphase"
Sister chromatids segregate.	Only homologous chromosomes separate not the chromatids.
Due to separation of chromatids number of chromosome in cell become double temporarily.	Number of chromosomes remains same, but reduction occurs as chromosome divide in two groups.

Q:57 What events occur in pachytene of meiosis?

Ans:

- The pairing of homologous chromosomes is completed.
- Chromosomes become more and more thick
- Crossing over occurs.
- Reshuffling of genetic material occurs which produces recombination.
- It may lasts for days, weeks or even years.

Q:58 What do you mean by the following terms as regarding the chromosomes?
(i) Tetrad (ii) Synapsis

Ans: Tetrad:

- Each paired but not fused complex structure of chromosomes is called tetrad or bivalent.
- **Synapsis:**
- Pairing of homologous chromosomes is called synapsis.

Q:59 Define crossing over.

Ans: The exchange of segment of the non-sister chromatids of homologous chromosomes is called crossing over. It results in large number of recombination.

Q:60 How does prophase 1 of meiosis differ from the prophase of mitosis?

Ans:

Prophase 1 of Mitosis	Prophase of Meiosis
It is a short stage	It is very long stage
The chromosomes are not arranged in homologous pairs.	The chromosomes are arranged in homologous pairs.
It is not subdivided into sub stages	It is subdivided into five sub-stages Leptotene, Zygotene, Pachytene, Diplotene, and Diakinesis
No crossing over occurs	Crossing over occurs

PAST PAPER QUESTIONS:

Q:61 Define meiosis and mitosis. **(LHR 2017)**

Q:62 What are the main features of metaphase-I of meiosis? **(GRW 2017)**

Q:63 How chiasmata formation occurs? **(SGD 2017)**

Q:64 How meiosis is important for living individuals? **(MTN 2017)**

Q:65 Explain diplotene stage in prophase I of meiosis. **(DGK 2017)**

Q:66 What are the events of zygotene of prophase I of meiosis? **(SGD 2018)**

Q:67 What happens during metaphase I? **(MTN 2019)**

Q:68 What is crossing over? **(MTN 2019)**

Q:69 Define crossing over and synapsis. **(DGK 2019)**

Q:70 What are Events happen in Diakinesis? **(BWP 2019)**

Q:71 How does cell death help in development of multicellular organism. **(RWP 2019)**

Q:72 What happens during diplotene stage? **(RWP 2019)**

Q:73 What is tetrad? **(FSD 2021)**

Q:74 How does cell death help in development of multicellular organism. **(SGD 2021)**

Q:75 Give the significance of Meiosis. **(MTN 2021)**

Q:76 Give significant of meiosis. **(LCK 2022)**

MEIOTIC ERRORS (NON-DISJUNCTION), NECROSIS & APOPTOSIS

KIPS QUESTIONS

Q:77 Name the syndrome caused due to trisomy of 21st, 13th and 18th pair respectively.

Ans: Trisomy of 21st: Down syndrome

- Trisomy of 13th: Patau syndrome
- Trisomy of 18th: Edward syndrome

Q:78 What are the symptoms of Down's syndrome?

Ans: The affected individuals have flat, broad face, squint eyes with the skin folded in the inner corner and protruding tongue, mental retardation and defective development of central nervous system

PAST PAPERS QUESTIONS

Q:79 What do you mean by non-disjunction of chromosomes? **(SWL 2017)**
Q:80 What do you mean by non-disjunction? **(LHR 2017)**
Q:81 What is Klinefelter's syndrome? **(FSD 2017)**
Q:82 What are chromosomal aberrations? Write down its reasons. **(DGK 2017)**
Q:83 Define non-disjunction. **(BWP 2017)**
Q:84 Describe causes and symptoms of Down's syndrome. **(LHR 2018)**
Q:85 Write symptoms of Turner's syndrome. **(MTN 2017, 2018)**
Q:86 What is a turner's syndrome? Write briefly. **(LHR 2017, 2018)**
Q:87 Differentiate between necrosis and apoptosis. **(2017, DGK 2018)**
Q:88 What is the cause and symptoms of Down's syndrome? **(BWP 2018)**
Q:89 Differentiate between necrosis and apoptosis. **(SGD 2017, FSD 2018)**
Q:90 Write down the two functions of programmed cell death. **(SGD 2018)**
Q:91 What is the cause and symptoms of Down's syndromes. **(DGK 2019)**
Q:92 Define the term non-disjunction of Chromosomes. **(BWP 2019)**
Q:93 Differentiate between necrosis and apoptosis **(FSD 2019)**
Q:94 What is Apoptosis? **(SGD 2019)**
Q:95 What is Turner's syndrome? **(MTN 2021)**
Q:96 What do you know by turner's syndrome? **(RWP 2021)**
Q:97 Briefly discuss Turner's syndrome, with example. **(MTN 2022)**