NEET REVISION SERIES

CELL CYCLE & CELL DIVISION

Revise Most Important Questions to Crack NEET 2020



Q-1 - 23761001

Who found that new cells develop from preexisting cells ?

(A) Remak

(B) Virchow

(C) Prevost and Dumas

(D) Strasburger

CORRECT ANSWER: A





Q-2 - 10761358

Cells in G0 phase :

(A) terminate the cell cycle

(B) exit the cell cycle

(C) enter the cell cycle

(D) suspend the cell cycle

CORRECT ANSWER: B

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Q-3 - 10761378

The shorter and longer arms of a submetacentric chromosome are



(A) m-arm and n-arm respectively

(B) s-arm and I-arm respectively

(C) p-arm and q-arm respectively

(D) q-arm and p-arm respectively

CORRECT ANSWER: C

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Q-4 - 34342486

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

(A) Chromosomes will not condense

(B) Chromosomes will be fragmented

(C) Chromosomes will not segregate

(D) Recombination of chromosome arms will occur

If anaphase promoting complex is defective in a human cell, the chromosomes will not segregate during anaphase of mitosis. APC triggers the transition form metaphase to anaphase by tagging specific proteins for degradation.

Concept Enhancer Anaphase stage of mitosis is

characterised by two events

(a) Splitting of centromeres and segregation of chromosomes.

(b) Movement of chromatids towards the opposite poles .



Q-5 - 23761008

Colchicine is

(A) Mitotic poison

(B) Prophase poison

(C) Cytokinesis poison

(D) None of the above

CORRECT ANSWER: A

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Q-6 - 34342491

Which of the following is not a characteristic feature during mitosis



(A) Disapearance of nucleolus

(B) Chromosome movement

(C) Synapsis

(D) Spindle fibres

CORRECT ANSWER: C

SOLUTION:

Synapsis is pairing of homologous chromosomes. It

occur during zygotene stage of meiosis. The

homologous chromosomes come closer leading to cross

over in the next stage called pachytene. These are not

observed during mitosis.



Q-7 - 34342495

Mathc the stages of meisos in Column I to their characteristic

features in Column II and select the correct option using the codes

given below

Column-IColumn-IIPachytene(i)Pairing of homologous chromosomesMetaphase I(ii)Terminalization of chiasmataDiakinesis(iii)Crossing-over takes placeZygotene(iv)Chromosomes align at aquatorial plate



CORRECT ANSWER: A

SOLUTION:

Various phase of meiosis and their characteristic

features are

Pachytene - Crossing - over takes place

Mataphase-I - Chromosomes align at equatorial plate

Diakinesis - Terminalisation of chiasmata

Zygotene - Pairing of homologous chromosomes



Q-8 - 34342502

The enzyme recombinase is required in which stage of meiosis?

(A) Pachytene

(B) Zygotene

(C) Diplotene

(D) Diakinesis

CORRECT ANSWER: A

SOLUTION:

Crossing over is an enzymatic process occuring during

the pachytene stage of prophase -I. The enzyme

involved in this process is called recombinase which aids

in the recombination of genes between homologous chromosomes.

During zygotene stage, homologous chromosomes pair up by a process called synapsis and form a complex bivalent structure. Diplotene is marked by the dissolution of synaptonemal complex and chaisma formation. While diakinesis is marked by terminalisation of chiasmata (i.e. chiasmata shifts towards periphery of chromosome).

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Select the correct option with respect to mitosis



(A) Chromatids start moving towards opposite poles in telophase

(B) Golgi complex and endoplasmic reticulum are still visible at the end of prophase

(C) Chromosomes move to the spindle equator and get

aligned along equatorial plate in metaphase

(D) Chromatids separate but remains in the centre of the

cell in anaphase

In metaphase of mitosis, spindle fibres attach to

kinetochore of chromosomes. Chromosomes are moved

to spindle equator and get aligned along metaphasic

plate through spindle fibres to both pole.

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Q-10 - 34342520

In which stage of the cell cycle are histone proteins synthesised in a eukaryotic cells ?

(A) During G_2 - stage of prophase

(B) During S-phase

(C) During entire prophase

CORRECT ANSWER: B

SOLUTION:

During S-phase of cell cycle synthesis of histone proteins takes place because at this stage the amount of DNA per cell get double to that of somatic number. Histone proteins are basic (absent in prokaryotes) DNA. DNA and histones together comprise chromatin, forming bulk of the eukaryotic chromosomes. Histones are of five major kinds H1, H2A, H2B and H4. H1 histones link neighbouring nucleosomes.

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Q-11 - 34342530

Which of the following occurs more than one and less than five in a

chromosome?

(A) Chromatid

(B) Chromosome

(C) Centromere

(D) Telomere

CORRECT ANSWER: D

SOLUTION:

A chromosomes has one centromere, may have many

chromomeres, two chromatids, but four telomers (two

each at the opposite ends of each chromatid).



Q-12 - 34342537

A bacterium divides every 35 minutes. If a culture containing 10^5 cells/ml is grown for 175 minutes. What will be the cell concentration / ml after 175 minutes

(A) $5 imes 10^5$ cells

(B) $35 imes 10^5$ cells

(C) $32 imes 10^5$ cells

(D) $175 imes 10^5$ cells

CORRECT ANSWER: C

SOLUTION:

 $1 imes 10^5 \stackrel{
m 35\,min}{
m \longrightarrow} 2 imes 10^5$

 $70 \min$ $\xrightarrow{70\,\mathrm{mm}} 4 imes 10^5$

$rac{105\,\mathrm{min}}{\longrightarrow} 8 imes 10^5 \ rac{140\,\mathrm{min}}{\longrightarrow} 16 \ imes 10^5$

 $175 \min$ $\longrightarrow 32 \times 10^5$

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Q-13 - 34342554

In salivary gland chromosomes/polytene chromosomes, pairing is

(A) absent

(B) occasional

(C) formed between non-homologous chromosomes

(D) formed between homologous chromosomes

CORRECT ANSWER: D

SOLUTION:

Polytene chromosomes/salivary gland chromosomes

was reported by Balbiani (1881) from cells of salivary

glands of Chironomus larva (insect of Diptera droup).

The polytene chromosomes become giant due to the endoduplication, i.e., repeated replication of chromatids without their separation and cytokinesis. In fact, each polytene chromosome is formed by pairing of two somatic homologous chromosomes which undergo repeated endomitosis to form numerous strands attached to a common large chromocentre.

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Q-14 - 34342564

Meiosis-I is reductional division. Meiosis-II is equational division

due to

(A) pairing of homologous chromosomes

(B) crossing over

(C) separation of chromatids

CORRECT ANSWER: C

SOLUTION:

Meiosis - I is called heterotypic division as the two chromatids of a chromosome become genetically different due to the crossing over. Number of chromosomes is reduced to half, hence, called reduction division. Meiosis-II is just like mitosis but occours in haploid nuclei, it is called homotypic or equational division as the chromosomes are distributed equally into daughter cells and chromosome number remains the same in daughter cells.



Q-15 - 36806002

The stage during which separation of the paired homologous

chromosomes begin is

(A) diakinesis

(B) diplotene

(C) pachytene

(D) zygotene

SOLUTION:

The separation of the paired homologous chromosomes begins in diplotene stage. In this phase, the dissolution of synaptonemal complex begins. The recombined

homologous chromosomes of the bivalents separate

from each other except at the sites of crossovers.

Zygotene is the second state of prophase I of meiosis. It

is associated with the formation of synapsis. Next stage

is pachytene during which crossing over occurs between non-sister chromatids of the homologous chromosomes . Diakinesis is the final stage of meiotic prophase-I .This is

marked by terminalisation of chiasmata.

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Q-16 - 26856394

Of the total duration of cell cycle, the interphase lasts more than

(A) 95~%

(B) 5 %

(C) 90 %



CORRECT ANSWER: A

SOLUTION:

Of the total duration of cell cycle, the interphase lasts

more than 95%.

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Q-17 - 34342517

Synapsis occurs between

(A) a male and a female gamete

(B) mRNA and ribosomes

(C) spindle fibres and centromere

(D) two homologous chromosomes

CORRECT ANSWER: D

SOLUTION:

In zygotene of prophase-I homologous chromosomes

pair up. This process is called synapsis. One

chromosome of the pair is from the male parent and one

from the female parent.

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Q-18 - 34342547

Lampbrush chromosomes are visible

(A) prophase of mitosis

(B) diplotene of meiosis

(C) metaphase of meiosis

(D) interphase

CORRECT ANSWER: B

SOLUTION:

Lampbrush chromosomes were reported by W Flemming (1882) and described by Ruckert (1892) from nuclei of yolk rich primary oocytes of newts and frog (amphibians). These are also found in spermatocytes of many animals. These are found in spermatocytes of many animals. These are found in permanent diplotene stage of meiosis and do not undergo cell cycle. Each such chromosome has a double main axis made up of DNA and histones. The chromosomes are coiled and held at many places forming cross like structure called chiasmata. Loops arising laterally has uncoiled DNA which helps in rapid transcription and yolk synthesis.



Q-19 - 34342560

In meiosis, the daughter cells differ from parent cell as well as

amongst themselves due to

(A) segregation, independent assortment and crossing over

(B) segregation and crossing over

(C) independent assortment and crossing over

(D) segregation and independend assortment

CORRECT ANSWER: B

SOLUTION:

The daughter cells differ from parent cell as well as

amongst themselves due to the segregation and

crossing over taking place in them. Meiosis-I brings gene

recombinations and haploidy of number of

chromosomes. Crossing over during pachytene

produces new combinaton of genes and is the major

source of new genetic variations in the sexually

reproducing organisms.

Anaphase -I results in segregation of Mendelian factors,

essential for sexual reproduction, it also introduces

genetic variability.

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Q-20 - 34342539

How many mitotic divisions are needed for a single cell to make

128cells

(B) 14

(C) 28

(D) 64

A single mitotic division results in the production of two

cells from single cell.

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Q-21 - 26856401

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

CORRECT ANSWER: A

SOLUTION:

If a cell possesses twice as much DNA as in the

functional cell, the cell is preparing to divide.

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Q-22 - 26856425

Multinucleated condition arises due to karyokinesis is not followed

by cytokinesis, is called



(B) Coenocytic

(C) Synkaryon

CORRECT ANSWER: A

SOLUTION:

Multinucleated condition arises due to karyokinesis is not

followed by cytokinesis is called syncytium.

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Q-23 - 26856437

Which of the phase is the longest?

(A) Prophase



(C) Anaphase

(D) Telophase

Prophase of mitosis is the longest phase.

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Q-24 - 26856454

Which of the following is unique to mitosis and not a part of meiosis

(A) Homologous chromosomes cross over

(B) Homologous chromosomes pair and form bivalent

(C) Homologous chromosomes behave independentely

(D) Chromatids are separated during anaphase

CORRECT ANSWER: C

Homologous chromosomes behave independently into completed by the end of pachytene.

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Q-25 - 34342499

During which phase(s) of cell cycle amount of DNA in a cell remains at 4C level if the initial amount is denoted an 2C

(A) G_0 and G_1

(B) G_1 and S

(C) Only G_2

(D) G_2 and M

CORRECT ANSWER: D

During the S or synthetic phase, the DNA content doubles, i.e., from 2C to 4C for all diploid cells. The G_2 phase follows the S-phase and is called second growth phase or pre mitotic gap phase. In G_(2)` phase the synthesis of DNA stops therefore, the DNA level remains 4C if initial was 2C.

However, the formation of RNA and protein continue as they are required for the multiplication of cell organelles, spindle formation and cell growth. This amount becomes half (i.e.) 2C only during anaphase (in mitosis) when chromosomes separate.



Q-26 - 34342563

A bivalent of meiosis i consists of

(A) two chromatids and one centromere

(B) two chromatids and two centromeres

(C) four chromatids and two centromeres

(D) four chromatids and four centromeres

CORRECT ANSWER: C

SOLUTION:

Each pair of homologous chromosome carrying one maternal and one paternal chromosome of similar type is called bivalent. Each chromosome has two sister

chromatids and a centromere. Thus, bivalents

possesses four chromatids, two centromeres. This

bivalent with four chromatids is called pachytene tetrad

(quadrivalent).

Q-27 - 26856404

Which of the following cells in an adult animal do not appear to exhibit division

(A) Bone marrow cells

(B) Upper layer of epiderms

(C) Heart cells

(D) All of the above

CORRECT ANSWER: C

SOLUTION:

Heart cells in an adult animal donot appear to exibit

division.



Q-28 - 26856436

- Centromere is rquired for
 - (A) Crossing over
 - (B) Transcription
 - (C) Cytoplasmic cleavage
 - (D) Movement of chromosomes towards poles

CORRECT ANSWER: D

SOLUTION:

Centromere is required for movement of chromsomes

towards poles.



Prophase -I is subdivided into five phases based on

(A) chromosomal movement

(B) chromosomal alignment

(C) chromosomal behaviour

(D) chromosomal structure

CORRECT ANSWER: C

SOLUTION:

Prophase-I is subdivided into five phases based on

chromosomal behaviour.





Human cells in culture show a cell cycle to be completed in approximately.

(A) 42 hours

(B) 24 hours

(C) 24 minutes

(D) 24 seconds.

CORRECT ANSWER: B

SOLUTION:

A typical human cell divides once in approximately every 24 hours.



Q-31 - 13842265

Select the correct mathc

(A) Quiescent phase- G_2 phase

(B) Synthesis phase- G_1 phase

(C) Centromere splittting -Anaphase

(D) Chromosomal condensation-Telophase

CORRECT ANSWER: C

SOLUTION:

 G_0 phase is known as quiescent phase S phase is

known as synthesis phase. Chromosomal condensation

occurs in metaphase.



Q-32 - 13842268
Match column I with column II and select the correct option from

the given codes.

Column I V-shaped at anaphase L-shaped at anaphase J-shaped at anaphase

Column II

(ii)Acrocentric chromosome (ii)Metacentric chromosome (iii)Telocentric chromosome (iv))Sub-metacentric chromosome

(A) iv,ii,i,iii

(B) ii,iv,i,iii

(C) ii,iv,iiii,i

(D) iv,iii,ii,i



Q-33 - 34342538

During cell division in apical meristem nuclear membrane reappears

in

(A) metaphase

(B) anaphase

(C) telophase

(D) cytokinesis

CORRECT ANSWER: C

SOLUTION:

During telophase, nuclear envelope initially reforms

around each chromosome individually which later on

fuse to form complete nuclear envelope.

Metaphase Chromosomes are arranged equatorial plate.

Anaphase Chromosomes split longitudinally. Chromatids

migrate towards opposite poles.

Cytokinesis Division of cytoplasm.

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Q-34 - 34342562

Mitotic anaphase differs from metaphase in possessing

(A) same number of chromosomes and same number of chromatids

(B) half number of chromosomes and half number of chromatids

(C) half number of chromosomes and same number of chromatids

(D) same number of chromosomes and half number of

chromatids

CORRECT ANSWER: D

SOLUTION:

Mitotic metaphase is the best stage to observe the structure, size and number of chromosomes in a cell. Centromeres of all chromosomes lie closely at equator and their arms in defferent directions towards poles. Chromosomes are shortest in metaphase but thickest in anaphase.

In anaphase, centromere of each chromosome divides so that each sister shromatid now has its own centromere. Thus, mitotic anaphase in possessing same number of chromosomes and half number of chromatids.

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Q-35 - 13842233

Synthesis of histone proteins occurs in

(A) G_1 phase

(B) interphase

(C) anaphase

(D) G_0 phase.

CORRECT ANSWER: B

SOLUTION:

Replication of DNA along with the synthesis of nuclear proteins such as the histones occur during 5 phase of interphase.

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Q-36 - 13842243

Mitotic spindle is mainly composed of _____ proteins.

(A) tublin

(B) myosin

(C) actin

(D) actomyosin

CORRECT ANSWER: A

SOLUTION:

Spindle fibres are structures formed from mictrobubules in the cytoplasm during cell division. Microtubules are made up of tubulin protein. Spindle fiberes move chromatids or chromosomes diametrically apart and gather them in two d=clusters at opposite ends (poles) of





Given below is schematic break-up of phases of cell cycle. Which

one is correct matching ?





(B) C-karyokinesis

(C) D-synthetic phase

(D) A-cytokinesis

CORRECT ANSWER: C

SOLUTION:

Cell cycle completes in two steps, i.e. interphase and Mphase. Interphase is completed in three successive stages G_1 - phase (post mitotic phase), S-phase (synthetic phase) and G_2 - phase (premitotic or post synthetic phase). In the given figure. D is representing the S-phase (synthetic phase) of cell cycle.

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Q-38 - 26856446

The beginning of diplotene is recognised by the

(A) Dissolution of the synaptonemal complex

(B) Tendency of the recombined homologous

chromosomes of the bivalents to separate from each

other

(C) Meiotic spindle is assembled

(D) Both A and B

CORRECT ANSWER: D

SOLUTION:

The beginning of diplotene is recognised by the

dissolution of the synaptonemal complex and tendency

of the recombined homologous chromosomes of the

bivalents to separate from each other.



In which of the following stages, a choromosome is minimum coiled?

- (A) interphase
- (B) Metaphase
- (C) Prophase
- (D) anaphase.

CORRECT ANSWER: A

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The separation of two chromatids of each chromosome at early

anaphase is initiated by

(A) the interaction of centromere with the chromosomal

fibres

(B) the elongation of metaphasic spindle

(C) the force of repulsion between the divided

kinetochores

(D) all of these

CORRECT ANSWER: C

SOLUTION:

Kinetochore is a plate-like structure by which

microtubules of the spindle attach to the centromere of a

chromosome during nuclear division. The centromere of

each chromosome divides into two, so that each

chormatied comes to have its own centromere. The two

chromatids now start repelling each otherand separate

completely to become daughter chromosmes. the

daughter or new chromosmes. The daughter or new

chromosomes move towards the poles of spindle along

the path of their chromosome fibres.

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Q-41 - 13842281

Which phase of mitosis is essentially the reverse of prophase in

terms of nuclear changes?

(A) S-phase

(B) Anaphase

(C) Telophase



CORRECT ANSWER: C

SOLUTION:

During telophase of mitosis viscosity of cytoplasm decreases. A new nuclear membrane is formed (either from older nuclear envelope or ER) around each set of chromosomes. Chromosomes overlap forming chromatin. The Nucleolar organiser region of satelite chromosomes produce nucleolus for each daughter nucleus. Nucleoplasm surrounds in the area of chromatin. The gel state of spindle is converted into sol state and disappears. In this way two daughter nuclei are formed at the poles of spindle. Hence, this phase is just reverse of prophase.

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Q-42 - 34342558

Balbiani rings (puffs) are sites of

(A) DNA replication

(B) RNA and protein synthesis

(C) synthesis of polysaccharides

(D) synthesis of lipids

CORRECT ANSWER: B

SOLUTION:

In polytene chromosomes (salivary gland

chromosomes). Large swellings are called puffs or

Balbiani rings, named after their discoverer. In such

rings. DNA is active, uncoiled for rapid transcription of

RNA or protein synthesis.



Q-43 - 23761005

A mitogen of plant origin is

(A) Colchicine

(B) Epidermal growth factor

(C) Cytokinin

(D) Lymphokine.

CORRECT ANSWER: C

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Q-44 - 10761388

The correct sequence of phases of cell cycle is :

(A) $G1 o S o G_2 o M$

(B) $M o G_1 o G_2 o S$

(C) $G_1 o G_2 o S o M$

(D) $S o G_1 o G_2 o M$

CORRECT ANSWER: A

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Q-45 - 34342488

Which of the following option gives the correct sequence of events during mitosis

(A) Condensation \rightarrow nuclear membrane disassembly

ightarrow crossing over ightarrow segregation ightarrow telophase

(B) Condensation \rightarrow nuclear membrane disassembly

ightarrow arrangement at equator ightarrow centromere division

\rightarrow segregation \rightarrow telophase

(C) Condensation \rightarrow crossing over \rightarrow nuclear

membrane disassembly \rightarrow segregation \rightarrow telophase

(D) Condensation \rightarrow arrangement at equator \rightarrow

centromere division \rightarrow segregation \rightarrow telophase

CORRECT ANSWER: B

SOLUTION:

During mitosis following events occurs as follows Condensation of chromosomal material, which takes place at early prophase stage. During late prophase nuclear membrane disintegrates.

Then chromosomes get arranged at eequator in the metaphase stage. After that splitting of centromere and segregation of chromosomes occur in the anaphase stage. In telophase stage. chromosomes move to

opposite poles of the cell. It is last stage of mitosis.



When cell has stalled DNA replication fork, which checkpoint

should be predominantly activated

(A) G_1/S

(B) G_2/M

(C) M

(D) Both G_2 / M and M

CORRECT ANSWER: A

SOLUTION:

Stalled forks activate checkpoint signaling and pause

replication. Since, G_1 / S checkpoint checks DNA

damage, cells size prior to S-phase (i.e. DNA replication

phase), this checkpoint would be activated by stalled

DNA replication fork.

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Q-47 - 34342498

Arrange the following events of meiosis in correct sequence

- (a) Crossing over
- (b) Synapsis
- (c)Terminalisation of chiasmata
- (d) Disappearance of nucleolus.

(A) II, I, IV, III

(B) II, I, III, IV



(D) II, III, IV, I

CORRECT ANSWER: B

SOLUTION:

The correct sequence of events of meiosis are

Synapsis in zygotene \rightarrow Crossing over in

pachytene \rightarrow Terminalisation of chaismata in

diplotene \rightarrow Disapperance of nucleolus in diakinesis.

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Q-48 - 34342509

Given below is the representation of a certain event at a particular

stage of a type of cell division. Which is this stage



(A) Prophase-I during meiosis

(B) Prophase -II during meiosis

(C) Prophase of mitosis

(D) Both prophase and metaphase of mitosis

CORRECT ANSWER: A

SOLUTION:

During zygotene stage of prophase-I of meiosis-I,

bivalent chromosomes clearly appear as tetrads.

Pachytene stage is characterised by the appearance of

recombination nodules, the sites at which crossing over

(exchange of genetic material) occurs between non-

sister chromatids of the homologous chromosomes.

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Q-49 - 34342512

Which stages of cell division do the following figures A and B

represent respectively





(A) Metaphase - Telophase

(B) Telophase - Metaphase

(C) Late anaphase - Prophase

(D) Prophase - Anaphase

CORRECT ANSWER: C

SOLUTION:

In the given figures

A Late anaphase is characterised by following events

(i) Centromeres split and chromatids separate.

(ii) Chromatids move to opposite poles.

B. Prophase is characterised by centriole separation.



Q-50 - 34342523

Which one of the following precedes re-formation of the nuclear

envelope during M phase of the cell cycle.

(A) Decondensation from chromosomes and reassembly

of the nuclear lamina

(B) Transcription from chromosomes and reassembly of the nuclear lamina

(C) Fromation of the cntractile ring and formation of the phragmoplast

(D) Formation of the contractile ring and transcription

form chromosomes

CORRECT ANSWER: A

SOLUTION:

At telophase stage, nuclear membrane vesicles

associate with the surface of individual chromosomes

and fuse to reform the nuclear membranes, which partially enclose clusters of chromosomes before coalescing to reform the complete nuclear envelope. During this process the nuclear pores reassemble and the dephosphorylated reassociate to form the nuclear Iamina. One of the Iamina proteins (Iamina-B) remains with the nuclear membreane fragments throughout mitosis and may help nuclear reassembly. After the nucleus reforms, the chromosomes decondense and RNA synthesis resumes, causing the nucleolus to reappear.

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Q-51 - 34342535

Crossing over in diploid organism is responsible for

(A) dominance of genes

(B) linkage between genes

(C) segregation of alleles

(D) recombination of linked alleles

CORRECT ANSWER: D

SOLUTION:

The genes present on the same chromosome do not always remain together. These usually get separated and recombine with genes present on homologous chromosomes to form new combinations(recombinants).





Q-52 - 34342541

Which of the folliwng structure will not be common to mitotic cell

of a higher plant

(A) Cell plate

(B) Centriole

(C) Centromere

(D) Spindle fibres

CORRECT ANSWER: B

SOLUTION:

Centrosome is found in animals, Euglena, Nitella, some

fungi and members of dinoflagellate. It is found near the

nucleus.

Centriole is not common to mitotic cell of higher plants.

Main function of centrosome is at time of cell division

when the two centrioles separate and move on two

poles. Aster and spindle are formed from it which help in

the movement of chromatids. They form basal body,

cilia, flagella, etc.

Centriole is rich in tubulin and ATPase.

Centrioles replicate in G_2 - phase of interphase of cell

cycle but do not initiate cell division.

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Q-53 - 34342553

Best stage to observe shape, size and number of chromosome is

(A) interphase

(B) metaphase



(D) telophase

CORRECT ANSWER: B

SOLUTION:

Metaphase can be characterised by the chromosomes that are least coiled which show maximum condensation and are shortest in length. It is the best state to study the structure. Size and number of chromosome is prepared at mataphase.

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Q-54 - 34342518

The salivary gland Chromosomes in the dipteran larvae, are useful

in gene mappin because

(A) these are much longer in size

(B) these are easy to stain

(C) these are fused

CORRECT ANSWER: D

SOLUTION:

Balbiani (1881) was the first person who observed salivary gland chromosomes in the salivary glands of Chironomus larvae. These chromosomes are very useful in gene mapping because they have endoreduplicated chromosomes. These chromosomes are formed due to the process of endoduplication or endopolyploidy or endomitosis. In this process the nuclear membrene does not rupture but chromosomes become double and they do not separate from each other.



Q-55 - 34342559

Number of chromatids per chromosome at metaphase is

(A) two each in mitosis and meiosis

(B) two in mitosis and one in meiosis

(C) two in mitosis and four meiosis

(D) one in mitosis and two in meiosis

CORRECT ANSWER: A

SOLUTION:

In metaphase, chromosomes are thick, shortest least

coiled and minimum in size. Each chromosome has its

both chromatids attached at centromere, oriented at the

equator of spindle apparatus.

In meiotic metaphase, each, chromosome with two

chromatids in a bivalent is connected to the spindle pole

of its side by a kinetochore microtubule instead of two as

in metaphase of mitosis.



Q-56 - 26856403

Haploid complement of chromososme of an organism is

(A) Genotype

(B) Phenotype

(C) Genome

(D) Genetic system

CORRECT ANSWER: C

SOLUTION:

Haploid complement of chromosome of an organism is

called genome.

Q-57 - 26856424

Read the following statements and find out the incorrect statement.

(A) In an animal cell, cytokinesis is achieved by the appearance of a furrow in the plasma membrane.(B) Furrow formation starts in the centre of cell and grows outward to meet the existing lateral walls

(C) Cell plate represents the middle lamella between the walls of two adjacent plant cell.

(D) During cytokinesis, organelles like mitochondria and

plastids get distributed between the two daughter cells.

CORRECT ANSWER: B

SOLUTION:

In an animal cell, cytokinesis is achieved by the

appearance of a furrow in the plasma membrane.

Cell wall formation starts in the centre of cell and grows

outward to meet the existing lateral walls.

Cell plate represents the middle lamella between the walls of two adjacent plant cells.

During cytokinesis, organelles like mitochondria and

plastids get distributed between the two daughter cells.



Q-58 - 13842239

Which of the following pstatements is correct?

(A) Animals can sow mitotic divisions in both haploid and

diploid cells.

(B) After S phase the number of chromosomes becomes

double i.e., 2n to 4n.

(C) During the G_2 phase, proteins are synthesised in

preparation for mitosis while cell growth continues.

(D) S or synthesis phase marks the period during which

RNA synthesis takes place.

CORRECT ANSWER: C

SOLUTION:

Animals can show mitotic divisions only in diploid cells.

After S phase the number of chromosmes remains the

same i.e., 2n S or synthesis phase marks the period

during which DNA systhesis takes place.



Q-59 - 13842264

During anaphasic movements of chromosomes, ____ of each

chromosome is/are towards the pole and _____ of the chromosome trail(s) behind.

(A) centromere, arms

(B) arms, centromere

(C) chromatids, centromere

(D) none of these

CORRECT ANSWER: A

SOLUTION:

In anaphasic movement of chromosomes, the

centromeres lead the path while the arms trail behind.

As a result the anaphasic chromosomes appear V., L,J-

and I-shaped. The shapes are formed respectively in

metacentric, submetacentric, acrocentric and telocentric
chromosomes.



Q-60 - 34342525

- Crossing over that results in genetic recombination in higher organisms occurs between
 - (A) sister chromatids of bivalent
 - (B) non-sister chromatids of a bivalent
 - (C) two daughter nuclei
 - (D) two different bivalents

CORRECT ANSWER: B

SOLUTION:

The process of crossing over takes place in pachytene

stage of prophase-I of meiosis-I. In this process some

genes of two non-sister chromatids of a bivalent are exchanged.

The process of crossing over is depicted

Sister chromatids of one

duplicate chromosome

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