Cell Cycle and Cell Division

I. Select the correct answer from the following Questions:

Question 1.
Life starts from a single cell in plants and animals called
(a) Cell
(b) Zygote
(c) Tissue
(d) Growth

▼ Answer

Answer: (b) zygote

Question 2.
A typical eukaryotic cell cycle is illustrated by human cells in culture, which divide approximately every:
(a) 12 hours
(b) 10 hours
(c) 24 hours
(d) 6 hours

▼ Answer

Answer: (c) 24 hours

Question 3.
Yeast cell can progress through all the four stages of the cell cycle in only about:
(a) 60 minutes
(b) 90 minutes
(c) 30 minutes
(d) 45 minutes.

▼ Answer

Answer: (b) 90 minutes.

Question 4.
The interphase is divided into.
(a) G_1 phase (Gap1)
(b) S phase (Synthesis)
(c) G_2 phase (Gap2)
(d) ail of these stages.

▼ Answer

Answer: (d) All of these stages.

Question 5.
The S phase marks the period during which replication of DNA takes place. It is during this time that the content of DNA doubles, from
(a) 2C to 4C
(b) 4C to 2C
(c) (1n or 2n)
(d) (2n or 1n)

▼ Answer

Answer: (a) 2C to 4C.

Question 6.
The centrioles, in animal cells, initiate their replication in the cytoplasm during.
(a) G_1 phase
(b) G_2 phase
(c) S phase
(d) None of these phases.

▼ Answer

Answer: (b) G_2 phase.

Question 7.
In plants apical cells and the cambium tissue continue to divide all their life, they are called.
(a) Meristemic tissue

(b) cambium tissue
(c) equational division
(d) syneytium

▼ Answer

Answer: (a) Meristemic tissue.

Question 8.
Mitosis is divided into
(a) Prophase
(b) Metaphase
(c) Anaphase
(d) Telophase
(e) All of these phases.

▼ Answer

Answer: (e) All of these phases.

Question 9.
The small disc shaped structure at the surface of centromeres is called.
(a) Kinetochores
(b) sister chromatids
(c) microtubule
(d) Golgi complex

▼ Answer

Answer: (a) Kinetochores.

Question 10.
Mitosis accomplishes the segregation of duplicated chromosomes into daughter nuclei (karyokinesis), but the cell itself is divided into two daughter cells by a separate process called.
(a) Cytokinesis
(b) Karyokinesis
(c) Nucleolous
(d) Chromosome clusters.

▼ Answer

Answer: (a) Cytokinesis

Question 11.
In some organisms karyokinesis is not followed by cytokinesis as a result of which multinucleate condition arises which is called:
(a) Syncytium
(b) Meiosis I
(c) Cell-plate
(d) Meiosis II

▼ Answer

Answer: (a) Syncytium.

Question 12.
The cells having more than two complete sets of chromosomes are called
(a) Diploid
(b) Haploid
(c) Polyhybrid
(d) Polyploid.

▼ Answer

Answer: (d) Polyploid.

Question 13.
In Meiosis, the chromatids separate during
(a) Metaphase I
(b) Anaphase I
(c) Anaphase II
(d) Metaphase II

▼ Answer

Answer: (c) Anaphase II.

Question 14.
In the meiotic cell division four daughter ceils are produced by two successive division in which
(a) First division is reductional and second is equationai.
(b) First division is equationai, second is reductional.
(c) Both division are equationai.
(d) Both division are reductional.

▼ Answer

Answer: (a) First division is reductional and second is equationai.

Question 15.
Meosis is
(a) Reductional division
(b) Equationai division
(c) Multiplicational division
(d) Disjunctional division.

▼ Answer

Answer: (a) Reductional division.

Question 16.
The term meiosis was coined by
(a) Blackman
(b) Flemming
(c) Robertson
(d) Former and Moore.

▼ Answer

Answer: (d) Former and Moore.

Question 17.
Chromosomes counting is best done during
(a) Metaphase
(b) Telophase
(c) Late prophase
(d) Late anaphase.

▼ Answer

Answer: (a) Metaphase.

Question 18.
Meisosis II bring about
(a) Sepration of chromatids
(b) Separation of homologous chromosomes.
(c) Synthesis of DNA and centromere
(d) Separation of sex chromosomes.

▼ Answer

Answer: (a) Sepration of chromatids

Question 19.
In which stage the chromosomes appear as thin long thread?
(a) Leptotene
(b) Zygotene
(c) Prophase
(d) Pachytene.

▼ Answer

Answer: (a) Leptotene.

Question 20.
Anastral mitosis is found in
(a) All living organisms
(b) Lower animals.
(c) Higher plants
(d) Higher animals.

▼ Answer

Answer: (c) Higher plants.

II. Fill in the blanks:

Question 1.
Meiosis ends with telophase II, in which the …… are once again enclosed by a nuclear envelope, cytokinesis follows, resulting in the formation of tetrad of cells i.e., four haploid ……

▼ Answer

Answer: chromosomes, daughter cells

Question 2.
Anaphase begins with the simultaneous splitting of the …….. which hold the sister chromatids together, allowing them to move toward …….

▼ Answer

Answer: centromeres, opposite poles of the cell

Question 3.
Metaphase II the chromosomes align on the equator with micro¬tubules from opposite poles of the spindle get attached to the ……. of sister chromatids.

▼ Answer

Answer: kinetochores

Question 4.
Prophase II meiosis II initiates immediately after …….. usually before the ……. have fully elongated.

▼ Answer

Answer: cytokinesis, chromosomes

Question 5.
The stage between the two meiotic divisions is called …….. and is generally short lived.

▼ Answer

Answer: interkinesis

Question 6.
Diplotene X-shaped structures are called ……

▼ Answer

Answer: chsiamata

Question 7.
The complex formed by a pair of synapsed homologous chromosomes is called a ……. or a tetrad.

▼ Answer

Answer: bivalent

Question 8.
Zygotene is the second stage of prophase I during which certain chromosomes start pairing together and this process of association is called ……

▼ Answer

Answer: synapsis

Question 9.
Meiosis involves two sequential cycles of nuclear and cell division, called …… and …….. but only a single cycle of DNA replication.

▼ Answer

Answer: meiosis I, Meiosis II

Question 10.
M phase is the most dramatic period of the cell cycle, involing a major recoganization of virtually all cell components. Since the chromosome number (ploidy) of parent and progeny cell is the same it is also called as …….

▼ Answer

Answer: equational division

III. Mark the statement true (T) or false (F)

Question 1.
All organisms, even the largest, start their life from a single cell.

▼ Answer

Answer: True.

Question 2.
Growth and reproduction are characteristic of cells, indeed of all living organisms.

▼ Answer

Answer: True.

Question 3.
Cell division is a very important process in all organisms.

▼ Answer

Answer: True.

Question 4.
The requence of events by which a cell duplicates its genome, synthesies the other constituent of the cell and eventually divides into two daughter cells is termed cell cycle.

▼ Answer

Answer: True.

Question 5.
Yeast for example, can progress through the cell cycle in only about 24 hours.

▼ Answer

Answer: False.

Question 6.
The cell cycle is divided into two basic phases:
(1) M phase (mitosis phase)
(2) Interphase.

▼ Answer

Answer: True.

Question 7.
The 24 hour overage duration of cell cycle of a human cell, cell division proper lasts only about an hour. Hence, 95% of the progression of cell cycle is spent in interphase the period between two successive mitosis or cell division.

▼ Answer

Answer: True.

Question 8.
Interphase though called resting phase, is the time during which the cell is preparing for division by undergoing both cell growth and DNA replication in an orderly manner.

▼ Answer

Answer: True.

Question 9.
Prophase which is the second stage of mitosis follows the S and G_2 phases of interphase.

▼ Answer

Answer: False.

Question 10.
In an animal cell this is achieved by the appearance of a furrow in the plasma membrane. The furrow gradually deepens and ultimately joins in

the centre dividing the cell cytoplasm into two.

▼ Answer

Answer: True.

IV. Match the item of column I with the items of column II

Column I	Column II
(a) Mitosis is divided	1. Quiescent stage (Gg) of the cell cycle.
(b) Resting phase	2. at metaphase is referred to as the metaphase plate.
(c) G_1 phase to enter meristematically	3. Prophase, Metaphase, Anaphase Telophase.
(d) Prophase which is the first stage	4. (1) centromeres split and chromatids separate (2) Chromatids move to opposite poles.
(e) The plane of alignment of the chromosomes	5. at the end of meiosis II.
(f) Anaphase stage is characterised by the key events.	6. Interphase
(g) Four haploid cells are formed	7. called meiosis I and meiosis II
(h) Meiosis involves two sequential cycles of nuclear and cell division,	8. of mitosis follows the S and S_2 phases of interphase.
(i) Zygotene	9. second stage of prophase I.
(j) Crossing over is also an enzyme mediated process and the enzyme involved	10. is called recombinase.
(k) Diakinesis	11. This is the final stage of meiotic prophasel, marked by terminalisation of chaismata.
(l) Metaphase I	12. Meiosis ends with telophase II, in which the two groups of chromosomes once again get enclosed.
(m) Telophase I	13. It begins with the simultaneous splitting of the centromeres of each chromosome.
(n) Ananaphase II	14. The bivalent chromosomes align the equitorial plate.
(o) Telophase II	15. The nuclear membrane reap-pears, cytokinesis follows and this is called as diad of cells.

▼ Answer

Answer:

Column I	Column II
(a) Mitosis is divided	3. Prophase, Metaphase, Anaphase Telophase.
(b) Resting phase	6. Interphase
(c) G_1 phase to enter meristematically	1. Quiescent stage (Gg) of the cell cycle.
(d) Prophase which is the first stage	8. of mitosis follows the S and S_2 phases of interphase.
(e) The plane of alignment of the chromosomes	2. at metaphase is referred to as the metaphase plate.
(f) Anaphase stage is characterised by the key events.	4. (1) centromeres split and chromatids separate (2) Chromatids move to opposite poles.
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