

SARASWATI



HEAD OFFICE

208, CD, LOCAL SHOPPING CENTER
AGGARWAL SHOPPING PLAZA,

BRANCH -1

AYODHYA CHOWK SEC -3
ROHINI

BRANCH -2

DC CHOWK SEC- 9, ROHINI

9TH & 10TH MATHS / SCIENCE
11TH & 12TH – PHYSICS / CHEMISTRY / MATHS / BIOLOGY
EXCLUSIVE BATCH FOR NEET / JEE ASPIRANTS
Ph no. 9696 500 500 / 9696 400 400

Ch- 10 Cell Cycle and Division

1. What is the average cell cycle span for a mammalian cell?

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2. Which of the phases of cell cycle is of the longest duration?

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3. Which part of the human body should one use to demonstrate stages of mitosis?

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4. Two key events take place during S phase in animal cells: DNA replication and duplication of centriole. In which parts of the cell do these events occur?

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5. A cell has 32 chromosomes. It undergoes mitotic division. What will be the chromosome number (N) during metaphase? What would be the DNA content (C) during anaphase?

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6. It is observed that heart cells do not exhibit cell division. Such cells do not divide further

and exit phase to enter an inactive stage, called of cell cycle. (Fill in the blanks)

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7. If a tissue has at a given time 1024 cells, how many cycles of mitosis had the original parental single cell undergone?

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8. Given that the average duplication time of E.coli is 20 minutes, how much time will two E. coli cells take to become 32 cells?

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9. Which stage of cell division will you select to study the morphology of chromosomes and why?

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10. What is a metaphasic plate?

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11. Name the stage of mitosis, when chromosomes commence their poleward movement?

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12. Name the stage of cell division in which chromosomes cluster at opposite poles.

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13. What is a cell plate?

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14. Can there be DNA replication without cell division?

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15. Can there be mitosis without DNA replication in 'S' phase?

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16. Name the pathological condition when uncontrolled cell divisions occur.

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17. Why is mitosis called equational division?

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18. What are dyads?

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19. What is interkinesis?

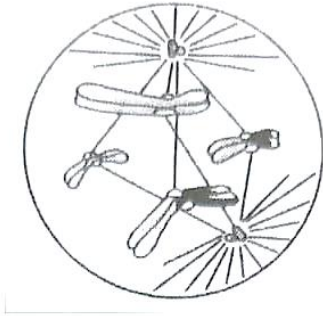
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20. An anther has 1200 pollen grains. How many pollen mother cells must have been there to produce them?

2 marks

21. Distinguish cytokinesis from karyokinesis.

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22. What is G_0 (quiescent phase) of cell cycle?

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23. Label the diagram and also determine the stage at which this structure is visible.



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24. The following events occur during the various phase of cell cycle. Name the phase against each of the events:

- (a) Disintegration of nuclear membrane
- (b) Appearance of nuclear membrane
- (c) Division of centromere.....
- (d) Replication of DNA.....

25. How does cytokinesis in plant cells differ from that in animal cells?

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26. Mitosis results in the production of two cells, which are similar to each other. What would be the consequence of each of the following irregularities that occurs during mitosis?

- (a) Nuclear membrane fails to disintegrate.
- (b) Duplication of DNA does not occur.
- (c) Centromere is not divided.
- (d) Cytokinesis does not occur.

27. Enlist any four significant points of meiosis.

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28. What is crossing over? Name the enzyme responsible for it.

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29. What are chiasmata? What is their significance?

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30. Differentiate between prophase and prophase I.

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31. When and why does reduction in the number of chromosomes take place in meiosis?

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32. Find examples where the four daughter cells from meiosis are equal in size and where they are found unequal in size.

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33. Where does mitosis take place in plants and animals? What is its significance in multicellular organisms?

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34. Name the stage of cell cycle at which each one of the following events occurs.

- (a) Chromosomes are moved to spindle equator.
- (b) Centromere splits and chromatids separate.
- (c) Pairing between homologous chromosomes occurs.
- (d) Crossing over between homologous chromosomes takes place.

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35. In which phase of meiosis are the following formed? Choose the answers from hint points given below:

- (a) Synaptonemal complex
- (b) Recombination nodules
- (c) Appearance/Activation of enzyme recombinase
- (d) Terminalisation of chiasmata
- (e) Interkinesis
- (f) Formation of dyad cells

[Hints: (1) After Telophase I/before meiosis II (2) Zygotene (3) Telophase I/After meiosis I (4) Pachytene (5) Diakinesis (6) Pachytene]

(iv) Nuclear division in mitosis.

(v) Phase in the cell cycle when proteins and RNA are synthesised.

39. List the main differences between mitosis and meiosis.

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40. According to cell theory, cells arise from pre-existing cells and the process involved is cell division. Sexually reproducing organisms start their life from a single cell, called zygote. Cell divisions do not stop with the formation of a mature organism, but continue throughout life.

- (a) What is meant by cell cycle?
- (b) What are the two phases in a cell cycle?
- (c) Which is the actual phase of cell division?
- (d) When (at what phase) do the cell organelles duplicate?
- (e) What value do you get from the process?

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41. Have you ever wondered how plants continue to grow throughout their life, but growth

stops in animals after a particular stage.

(a) Do all cells in a plant divide all the time?

(b) What name do you give to the (i) cells that divide always and (ii) locations of such cells in plants?

(c) Do animals also have similar locations where cells divide? Justify.

(d) What value do you get from these observations/facts?

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42. The production of offspring by sexual reproduction involves fusion of gametes, each with a haploid set of chromosomes. Gametes are formed from specialised cells by a kind of cell division, that halves the number of chromosomes from the parent cell to the daughter cells.

(a) What is this kind of cell division called?

(b) Why is the number of chromosomes reduced to half in this process?

(c) How many daughter cells are formed in the process?

(d) What is the value indicated?

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43. Kamal was reading that the pairing of homologous chromosomes at zygotene of meiosis I is called synapse. His mother corrects him and explains the words like 'bivalents', 'tetrads', etc.

- (a) What word in the statement read by Kamal is to be corrected?
- (b) What is the difference between bivalents and tetrads?
- (c) At what stage do the synapsed chromosomes start repelling each other?
- (d) What value is shown in the above process?

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