



BIOLOGY

BOOKS - KUMAR PRAKASHAN KENDRA

BIOLOGY (GUJRATI ENGLISH)

CELL CYCLE AND CELL DIVISION

**Section A Exam Oriented Questions Answers
From Darpan Introduction**

1. Give importance of cell division for growth in living organisms.



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Section A Exam Oriented Questions Answers From Darpan M Phase

1. What is meant by cell cycle ? Explain.



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2. Explain various phases of cell cycle in detail.



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3. Explain the events occurring in G_1 phase in short.



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4. Describe the changes occurring during synthesis phase.



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5. Explain G_2 phase in short.



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6. What is called quiescent stage? Give information.



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7. Describe various phases of mitosis in detail with diagram.



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Section A Exam Oriented Questions Answers From Darpan Significance Of Mitosis

1. Explain importance of Mitosis.



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Section A Exam Oriented Questions Answers From Darpan Meiosis

1. What is Meiosis ? Give the key features of it.
Explain them.



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2. Describe various subphases of prophase - I
of Meiosis - I.



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3. Describe Metaphase - I, Anaphase - I and Telophase - I of Meiosis - I.



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4. Describe the changes and various phase seen during Meiosis - II with diagram.



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**Section A Exam Oriented Questions Answers
From Darpan Significance Of Meiosis**

1. Explain importance of meiosis.



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Section B Difference Scientific Reasons Give Differences 2 Marks

1. Karyokinesis and Cytokinesis .



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2. Prophase of Mitosis and Prophase of Meiosis .



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3. Mitosis and Amitosis



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4. Describe Metaphase - I, Anaphase - I and Telophase - I of Meiosis - I.



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Section B Difference Scientific Reasons Give Scientific Reasons 2 Marks

1. Meiosis is important for maintenance of specific number of chromosomes from generation to generation.



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2. Meiosis process play an important role in evolution of species.



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3. Meiosis is called reductional division.



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4. Mitosis is necessary for growth, development and repair of the cell.



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Section C Difference Explanation Terms

1. What is meant by cell cycle ? Explain.



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2. Describe the events taking place during interphase.



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3. Why is mitosis called equational division ?



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4. Describe various subphases of prophase - I of Meiosis - I.



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5. Chiasmata





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6. Syncytium



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7. Karyokinesis and Cytokinesis .



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8. Karyokinesis and Cytokinesis .





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Section D Textual Exercise

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



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2. Distinguish cytokinesis from karyokinesis.



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3. Describe the events taking place during interphase.



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



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5. Why is mitosis called equational division ?



6. Name the stage of cell cycle at which one of the following events occur :

(i) Chromosomes are moved to spindle equator.

(ii) Centromere splits and chromatids separate.

(iii) Pairing between homologous chromosomes 'takes place.

(iv) Crossing over between homologous chromosomes takes place.





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7. Describe the following:

(a) synapsis (b) bivalent (c) chiasmata

Draw a diagram to illustrate your answer



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



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9. 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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10. Distinguish anaphase of mitosis from anaphase I of meiosis.



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11. List the main differences between mitosis and meiosis.



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12. What is the significance of meiosis?



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13. Discuss with your teacher about

(i) haploid insects and lower plants where cell-

division occurs, and

(ii) some haploid cells in higher plants where cell-division does not occur.



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



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15. Can there be DNA replication without cell division ?



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16. Analyse the events during every stage of cell cycle and notice how the following two parameters change

(i) number of chromosomes (N) per cell

(ii) amount of DNA content (C) per cell



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Section E Solution Of Ncert Exemplar Multiple Choice Questions Mcqs

1. Meiosis in diploid organisms results in

A. Production of gametes

B. Reduction in the number of chromosomes

C. Introduction of variation

D. all of the above

Answer: D



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2. At which stage of meiosis does the genetic constitution of gametes is finally decided

- A. Metaphase I
- B. Anaphase II
- C. Metaphase II
- D. Anaphase I

Answer: D



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3. Meiosis occurs in organisms during

- A. Sexual reproduction
- B. Vegetative reproduction
- C. Both (A) and (B)
- D. None of the above

Answer: A



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4. During anaphase-I of meiosis

(A) Homologous chromosomes separate

(B) Non-homologous autosomes separate

(C) Sister chromatids separate

(D) Non-sister chromatids separate

A. Homologous chromosomes separate

B. Non-homologous autosomes separate

C. Sister chromatids separate

D. Non-sister chromatids separate

Answer: A



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5. Mitosis is characterized by

(A) Reduction division

(B) Equal division

(C) Both (A) and (B)

(D) None of these

A. Reduction division

B. Equal division

C. Both (A) and (B)

D. None of the above

Answer: B



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6. A bivalent of meiosis-I consists of

A. Two chromatids and one centromere

B. Two chromatids and two centromere

C. Four chromatids and two centromere

D. Four chromatids and four centromere

Answer: C



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7. Cells which are not dividing are likely to be at

A. G_1

B. G_2

C. G_0

D. S phase

Answer: C



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8. Which of the events listed below is not observed during mitosis ?

(A) Chromatin condensation

(B) Movement of centrioles to opposite poles

(C) Appearance of chromosomes with two

chromatids joined together at the centromere.

(D) Crossing over

A. Chromatin condensation

B. Movement of centrioles to opposite poles

C. Appearance of chromosomes with two chromatids joined together at the centromere.

D. Crossing over

Answer: D



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9. Identify the wrong statement about meiosis

(A) Pairing of homologous chromosomes

(B) Four haploid cells are formed

(C) At the end of meiosis the number of chromosomes are reduced to half

(D) Two cycle of DNA replication occurs

A. Pairing of homologous chromosomes

B. Four haploid cells are formed

C. At the end of meiosis the number of chromosomes are reduced to half

D. Two cycle of DNA replication occurs

Answer: D



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10. Select the correct statement about G1 phase.

A. Cell is metabolically inactive

B. DNA in the cell does not replicate

C. It is not a phase of synthesis of
macromolecules

D. Cell stops growing

Answer: B



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**Section E Solution Of Ncert Exemplar Very Short
Answer Type Questions**

1. Between a prokaryote and a eukaryote, which cell has a shorter cell division time ?



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



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3. Name a stain commonly used to colour chromosomes.



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4. Which tissue of animals and plants exhibits meiosis?



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5. 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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6. Which part of the human body should one use to demonstrate stages in mitosis ?



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7. What attributes does a chromatid require to be classified as a chromosome?



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8. The diagram shows a bivalent at prophase-I of meiosis. Which of the four chromatids can cross over ?



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



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11. At what stage of cell cycle does DNA synthesis take place ?



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12. It is said that the one cycle of cell division in human cells (eukaryotic cells) takes 24 hours. Which phase of the cycle, do you think occupies the maximum part of cell cycle ?



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13. 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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14. 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

Rrecombinase

(d) Termination of chiasmata

(e) Interkinesis

(f) Formation of dyad of cells

Hints :

(a) Zygotene

(b) Pachytene

(C) Pachytene

(d) Diakinesis

(e) After Telophase-I/Before prophase Meiosis-

II

(f) Telophase-I / After Meiosis-I



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15. State the role of centrioles other than spindle formation.



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Section E Solution Of Ncert Exemplar Short Answer Type Questions

1. Mitochondria and chloroplasts have their own DNA (genetic material). What is known about their fate during nuclear division like mitosis ?



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



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3. 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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4. While examining the mitotic stage in a tissue, one finds some cells with 16 chromosomes and some with 32 chromosomes. What possible reasons could

you assign to this difference in chromosome number. Do you think cells with 16 chromosomes could have arisen from cells with 32 chromosomes or vice versa ?



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5. The following events occur during the various phases of the cell cycle. Name the phase against each of the events.

(a) Disintegration of nuclear membrane

(b) Appearance of nucleolus

(c) Division of centromere

(d) Replication of DNA



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6. Mitosis results in producing two cells which are similar to each other. What would be the consequence if each of the following irregularities occur during mitosis?

(a) Nuclear membrane fails to disintegrate

(b) Duplication of DNA does not occur

(c) Centromeres do not divide

(d) Cytokinesis does not occur



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7. Both unicellular and multicellular organisms undergo mitosis. What are the differences, if any, observed in the process between the two ?



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8. Name the pathological condition when uncontrolled cell division occurs.



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



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10. Comment on the statement - Meiosis enables the conservation of specific chromosome number of each species even though the process per se, results in reduction of chromosome number.



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11. Name a cell that is found arrested in diplotene stage for months and years.

Comment in 2-3 lines how it completes cell cycle ?



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



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Section E Solution Of Ncert Exemplar Long Answer Type Questions

1. Comment on the statement - Telophase is reverse of prophase.



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2. What are the various stages of meiotic prophase-I ? Enumerate the chromosomal events during each stage ?



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3. List the main differences between mitosis and meiosis.



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4. Write brief note on the following

(a) Synaptonemal complex

(b) Metaphase plate



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5. Write briefly the significance of mitosis and meiosis in multicellular organism.



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6. An organism has two pair of chromosomes (i.e., chromosome number = 4).

Diagrammatically represent the chromosomal arrangement during different phases of meiosis-II.



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Questions From Module Important Mcq For Neet

1. The stage of short duration between interphase and division is called

(A) G_a

(B) G_B

(C) G_r

(D) G_0

A. G_a

B. G_B

C. G_r

D. G_0

Answer: D



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2. The time duration of cell cycle of is comparatively less / small.

(A) Human

(B) Yeast

(C) Dog

(D) Monkey

A. Human

B. Yeast

C. Dog

D. Monkey

Answer: B



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3. In phase of interphase, genetic material is doubled.

A. G_1

B. G_2

C. S

D. (A) and (B) both

Answer: C



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4. Appearance of bivalent state of chromosomes is a main characteristic of phase.

A. Diplotene

B. Zygotene

C. Pachytene

D. Diakinesis

Answer: B



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5. In mitosis, arrangement of separate chromosomes and to from centromere can be related to which stage ?

A. Prophase

B. Metaphase

C. Telophase

D. Anaphase

Answer: D



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6. The end time changes of prophase can be considered inverse changes of phase.

A. Beginning of prophase

B. Metaphase

C. Telophase

D. Anaphase

Answer: C



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7. When is interphase seen?

- A. In the beginning of cell division
- B. At the end of division in daughter cell
- C. Between two divisions
- D. A, B, C all three

Answer: D



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8. It can be considered as an important event for evolution.

(A) Crossing over

(B) Cytokinesis

(C) Interphase

(D) Synapsis

A. Crossing over

B. Cytokinesis

C. Interphase

D. Synapsis

Answer: A



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9. Statement X : First prophase of meiosis is complex.

Statement Y: There are 5 sub stages in first prophase.

Statement Z: Prokaryotic cell divides only for one.

(A) Statement X, Y correct, Z incorrect

(B) Statement X, Y incorrect, Z correct

(C) Statement X, Z correct, Y incorrect

(D) Statement Y, Z correct, X incorrect

A. Statement X, Y correct, Z incorrect

B. Statement X, Y incorrect, Z correct

C. Statement X, Z correct, Y incorrect

D. Statement Y, Z correct, X incorrect

Answer: D



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Question Paper Answer The Following In Short Each Of 1 Mark

1. By what name Go stage is known in cell cycle
?



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2. In which stage synapsis event is seen?



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3. In phase of interphase, genetic material is doubled.



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4. Name the complex phase of meiosis.



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5. In phase nuclear membrane completely disappears.



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6. Write definition of cell cycle.



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Question Paper Do As Directed Each Of 2 Marks

1. Write a short note on : Prophase of mitosis



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2. Karyokinesis and Cytokinesis .



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Question Paper Do As Directed Each Of 3 Marks

1. Describe the events taking place during interphase.



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Question Paper

1. List the main differences between mitosis and meiosis.



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Question Paper Describe In Detail

1. Describe various subphases of prophase - I of Meiosis - I.



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