



# **BIOLOGY**

## **BOOKS - EVERGREEN BIOLOGY (ENGLISH)**

### **CELL CYCLE, CELL DIVISION AND STRUCTURE OF CHROMOSOME**

#### **Review Questions**

**1. The shortest stage of mitosis.**



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2. The structure which initiates cell division in animal cell.



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3. The tip of the chromosome which are rounded and sealed.



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4. The type of chromosome whose centromere is in the middle.



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5. The stage of mitosis during which nuclear membrane and nucleolus reappears.



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6. A membrane that disappears during late prophase.



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7. A pair of chromosomes carrying dissimilar alleles for a particular character.



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8. Acts as bearer of heredity units.



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9. Two animals which have nineteen pairs of chromosomes.



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10. A region of plant body where cell division occurs very actively.



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**11.** Structure that initiates cell division.



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**12.** Chromosomes appear thread like.



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**13.** The type of cell division which occurs in the cells of the reproductive organs.



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**14.** The exchange of chromatid parts between the maternal and paternal chromatids of a pair of homologous chromosomes during meiosis.



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**15.** The number of chromosomes present in a nerve cell of a human being.



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**16.** Growth of cell, synthesis of DNA, synapsis and synthesis of proteins.



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**17.** Synapsis, crossing over, chiasma formation and interkinesis.



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**18.** Aster formation, spindle formation, disappearance of nucleolus and formation of equatorial plate.



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**19.** Find the odd one out : Splitting of centromere, formation of daughter chromosomes, reappearance of nucleolus.



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20. Phosphate, RNA, Sugar, Nitrogenous base.



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21. Centrosome, Cell wall, Cell membrane,  
Large vacuoles.



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22. Nuclear envelope disappears.



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**23.** Reappearance of nucleolus.



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**24.** Formation of equatorial plate.



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**25.** Formation and movements of asters towards the opposite poles.





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26. Uncoiling and elongation of chromosomes.



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27. Splitting of centromere and movement of daughter chromosomes towards opposite poles.



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**28.** Who coined the terms mitosis and meiosis?



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**29.** Name the cell division that takes place during gametogenesis. What is its significance ?



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**30.** Pairing of homologous chromosomes is known as ..... and takes place in .....



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**31.** ..... is the mutual exchange of corresponding parts of non-sister chromatids.



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**32.** After crossing over the points of attachment between non-sister chromatids are called..... .



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**33.** Meiosis-I is also known as ..... division.



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**34.** The structure to which both chromatids of a chromosome are attached is known as ?



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**35.** Define the following terms :

(a) Cell (b) Cell organelle

(c) Mitosis (d) Meiosis

(e) Evolution (f) Crossing -over

(g) Karyokinesis (h) Diploid

(i) Interphase







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**36.** How mitosis differs in animal and plant cells?



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**37.** Differentiate between :

Mitosis and Meiosis



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**38.** Differentiate between :

Centrosome and Centromere



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**39.** How mitosis differs in animal and plant cells?



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**40.** What is cell cycle ? Diagrammatically explain cell cycle



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**41.** With the help of self explanatory diagrams show the process of mitosis.



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**42.** Give significance of mitosis and meiosis.



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**43.** A cell has 5 pairs of chromosomes. After mitotic division, the number of chromosomes in daughter cell will be

- A. 5
- B. 10
- C. 20
- D. 40

**Answer:**



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44. The points where two non-sister chromatids cross-over are called

A. chiasmata

B. centromere

C. chromatids

D. centromeres

**Answer:**



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**45.** The point where two sister chromatids of a chromosome are attached is known as

- A. chiasmata
- B. centromere
- C. chromomeres
- D. homotypic

**Answer:**



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46. Which of the following is known as post-mitotic phase ?

A.  $G_1$ -phase

B.  $G_2$ -phase

C. M-phase

D. None of these

**Answer:**



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47. Duplication of chromatin material takes place during

A.  $G_1$ -phase

B.  $G_2$ -phase

C. S-phase

D. M-phase

**Answer:**



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**48.** Meiosis-I is reductional division. Meiosis-II is equational division due to

- A. Meiosis-I
- B. Meiosis-II
- C. Mitosis
- D. Interphase.

**Answer:**



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**49.** Explain the structure of an eukaryotic chromosome.



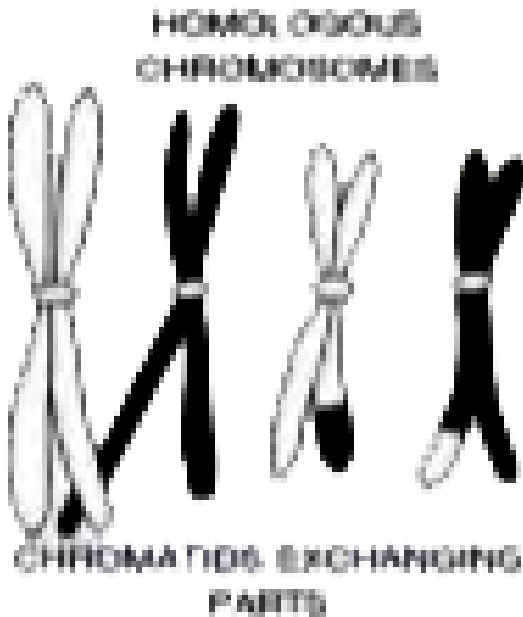
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**50.** Why is cell division necessary ?



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**51.** The diagram given below represents a certain phenomenon occurs during meiosis :



Name of the phenomenon

Define the phenomenon

State the difference between chromosome and chromatid



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**52.** Give one point of difference between the following pairs on the basis of what is indicated in brackets:

Metacentric and Telocentric (Centromere)

Centromere and Telomere (Location)

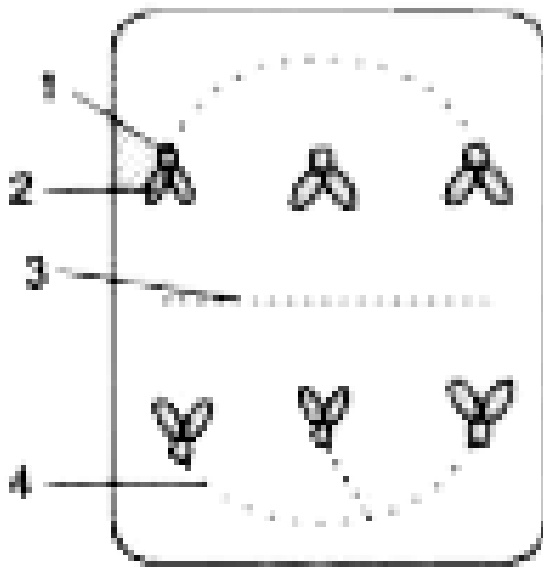
Maternal and Paternal chromosomes (Source)

Allosome and Autosome (Function)



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**53.** The diagram given below represents a stage of a cell:



Name the stage.

Is it a plant cell or animal cell? Give a logic reason.

Label the parts 1-4



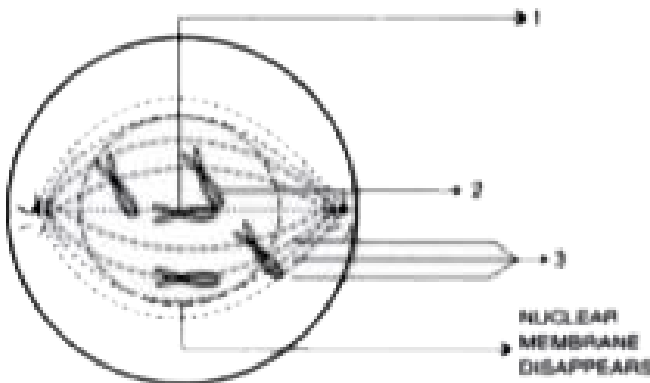
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54. Draw a well labelled diagram of metaphasic chromosome.



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55. Given below is a diagram representing a stage during mitotic cell division in an animal cell:

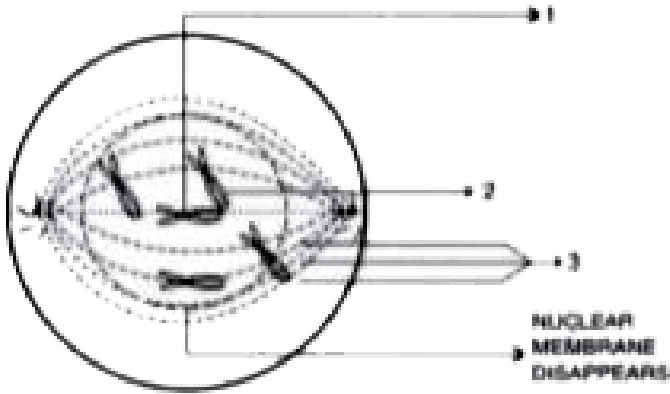


Identify the above stage! Give a reason to support your answer.



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**56.** Given below is a diagram representing a stage during mitotic cell division in an animal cell:



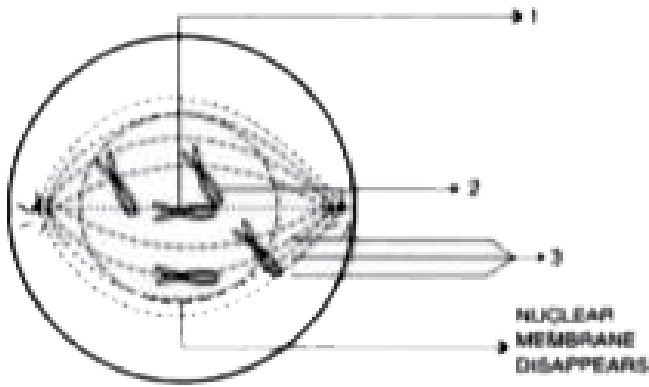
Name the cell organelle that forms the 'aster'.



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57. Given below is a diagram representing a stage during mitotic cell division in an animal cell:



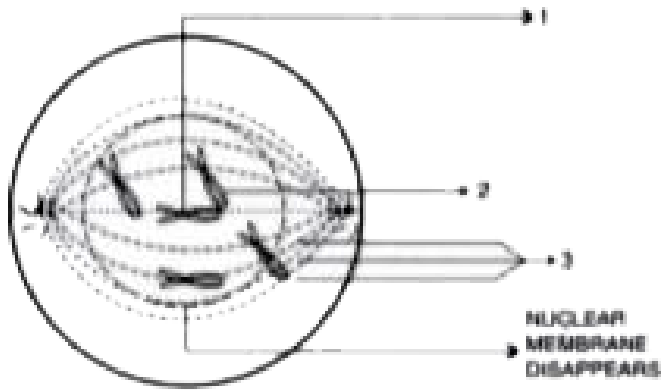


Name the parts labelled 1, 2 and 3.



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**58.** Given below is a diagram representing a stage during mitotic cell division in an animal cell:

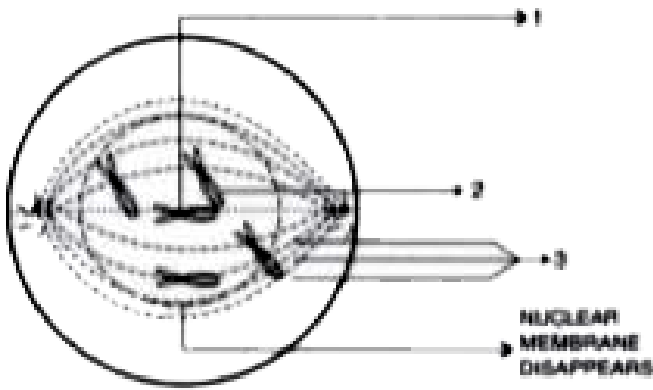


Name the stage that follows this stage of mitosis. How can this stage be identified ?



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**59.** Given below is a diagram representing a stage during mitotic cell division in an animal cell:



Mention two points of difference between 'mitosis' and 'meiosis' with regard to :

The number of daughter cells formed.

The chromosome number in the daughter cells.



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**60.** What do you understand by karyokinesis and cytokinesis? Mention differences in both of them.



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**61.** Differentiate between :

Mitosis and Meiosis



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**62.** Differentiate between :

Differentiate between Tonoplast and Plasma membrane (Location)



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**63.** Gametes have a haploid number of chromosomes.



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64. Duplicated chromosomes are joined at a point termed (centrosome, centromere, centriole, chromatid).



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65. Match the column A with column B.

Column A	Column B
(i) Chromosomes become arranged in a horizontal plane at the equator.	Anaphase
(ii) Daughter chromosomes move to opposite poles of spindle.	Prophase
(iii) Chromosomes become visible as fine, long threads.	Telophase
(iv) Chromosomes lose their distinctiveness and gradually become transformed into chromatin network	Nucleosome
(v) DNA and histones	Metaphase



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**66.** Draw a neat labelled diagram to show the metaphase stage of mitosis in an animal cell having four chromosomes.



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**67.** How many daughter cells are formed at the end of mitosis and at the end of meiosis?



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**68.** With reference to cell division explain the following terms:

Chromatid, Centromere, Haploid.



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**69.** The given diagram shows a stage during mitotic division in an animal cell:





Name the type of cell division that occurs during:

- A. Growth of a shoot
- B. Formation of pollen grains.



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70. Interphase, Anaphase, Prophase, Telophase, Metaphase. (sequential stage in Karyokinesis).



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71. Metaphase , telophase , prophase, anaphase.



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72. Karyokinesis, S-phase, cytokinesis,  $G_1$ -phase,  $G_2$ -phase (cell cycle).



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**73.** Draw a diagram of the nucleus of a cell, having chromosome number 6, as it would appear in the Metaphase stage of Mitosis and label the following parts in the diagram: Aster  
Achromatic spindle Chromatid Centromere.

A. Aster

B. Achromatic spindle

C. Chromatid

D. Centromere.

**Answer:**



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**74.** Cytokinesis is a division of cytoplasm.



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**75.** Gene is a specific part of a chromosome that determines hereditary characteristics.



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76. Duplicated chromosomes are joined at a point termed (centrosome, centromere, centriole, chromatid).



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77. The number of pairs of autosomes in man is 22.



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**78.** The resting state in mitosis is called interphase.



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**79.** Mitosis is the type of cell division occurring in the cells of injured parts of the body.



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**80.** Fill the gaps of the following paragraph taking appropriate words from the bracket (first, second, meiosis, mitosis, 1:1, 1:2, gametes, male, female, 50%, 100%). In human beings male has XY and female has XX chromosome complement. The sex chromosomes segregate during the (a) division of (b)\_\_\_\_. The X-chromosome constitutes (c) \_\_\_\_ of produced sperms and (d)\_\_\_\_ of eggs. If randomly mated, the ratio of sex expression is (e) \_\_\_\_\_. The sex of the offspring is determined by (f)\_\_\_\_ of (g) \_\_\_\_\_.



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**81.** State whether the following statements are True or False. If False rewrite the correct form of the statement by changing the first or last word only:

Lysosomes is a part of the cell in which chromosomes are present



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**82.** State whether the following statements are true or false. If false, rewrite the correct form of the statement by changing the first or last word only:

Centrosome is an organelle of the cell to initiate cell division.



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**83.** Give the specific function of:

(i) Centrosome

(ii) Stoma

(iii) Transpiration

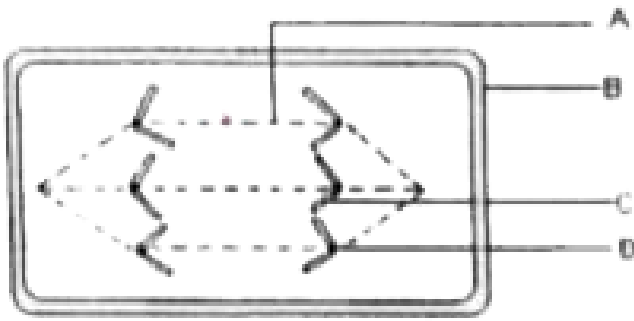
(iv) Ureter

(v) Vitreous humour



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**84.** The diagram given below represents a stage in cell division. Study the same and answer the questions that follows:



Where does this type of cell division usually occur?



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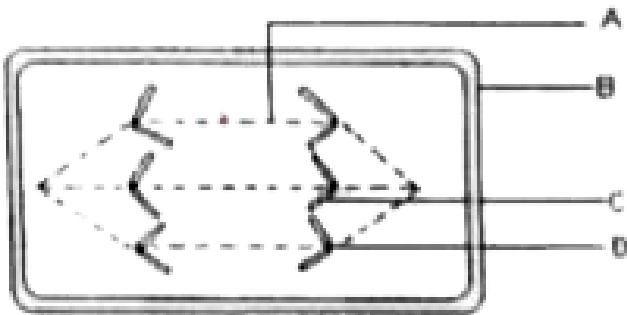
**85.** Study the diagram given below and then answer the questions that follow :



State the function of the parts labelled 1,2,3 and 4

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**86.** The diagram given below represents a stage in cell division. Study the same and answer the questions that follows:



How many daughter cells are formed from this type of cell division ?



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**87.** The diagram given below represents a stage in cell division. Study the same and answer the questions that follows:



Where does this type of cell division usually occur?

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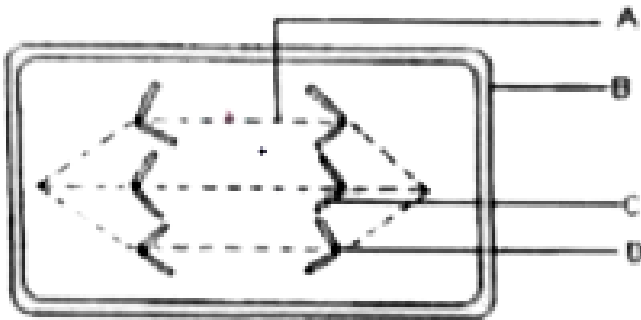
**88.** The diagram given below represents a stage in cell division. Study the same and answer the questions that follows:



How many daughter cells are formed from this type of cell division ?

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**89.** The diagram given below represents a stage in cell division. Study the same and answer the questions that follows:



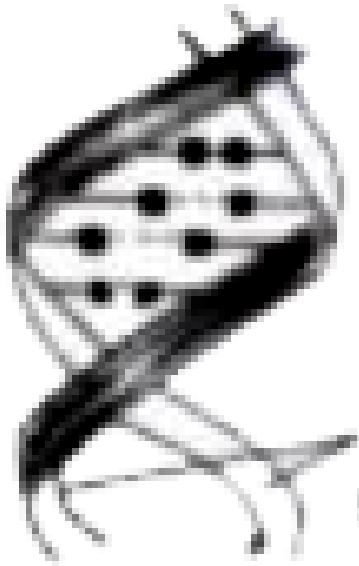
Is the dividing cell shown a plant or an animal cell? Give a reason to support your answer.



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**90.** Given below is a diagram of a double helical structure of DNA.





**Double  
strand of  
DNA**

Name the four nitrogenous bases that form a DNA molecule.



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91. Given below is a diagram of a double helical structure of DNA.



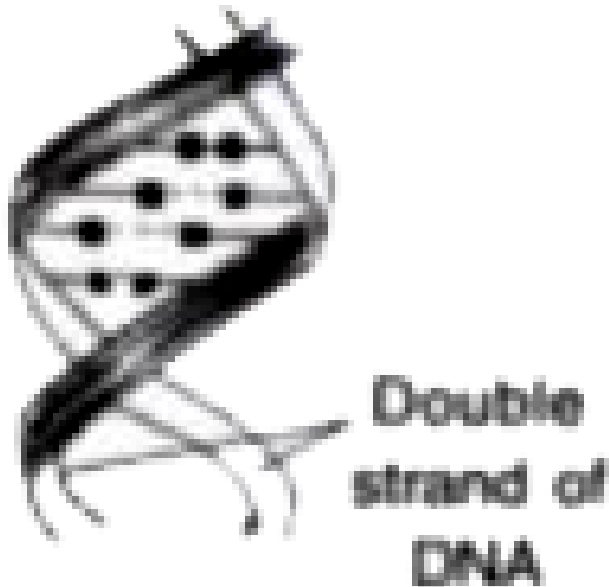
Double  
strand of  
DNA

Give the full form of DNA.



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92. Given below is a diagram of a double helical structure of DNA.



Name the unit of strand of DNA heredity.



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93. Given below is a diagram of a double helical structure of DNA.

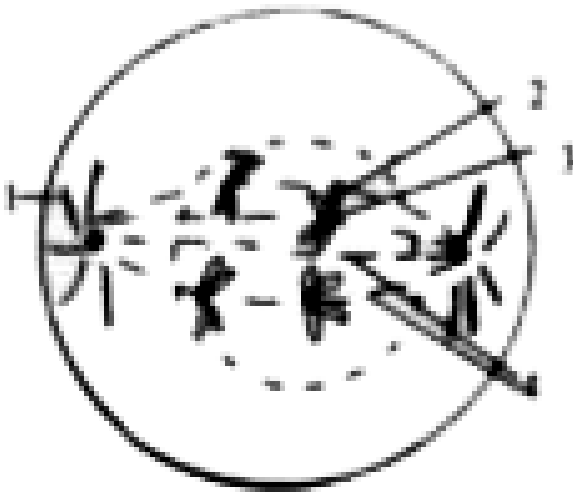


Mention two points of difference between Mitosis and Meiosis.



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94. Given diagram representing a stage during mitotic cell division in an animal cell:

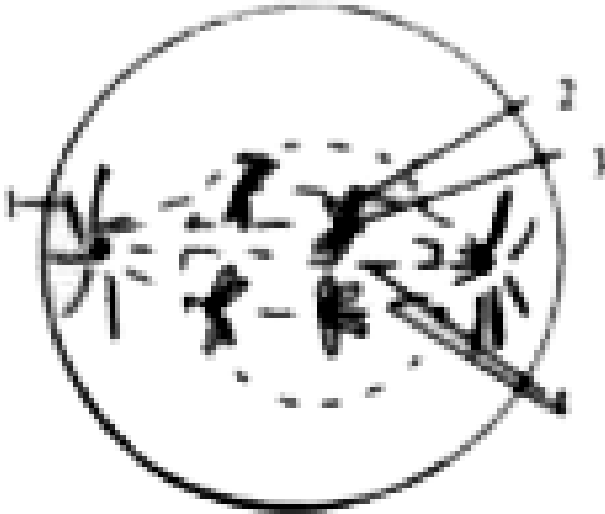


Identify the above stage. Give a reason to support your answer.



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95. Given diagram representing a stage during mitotic cell division in an animal cell:

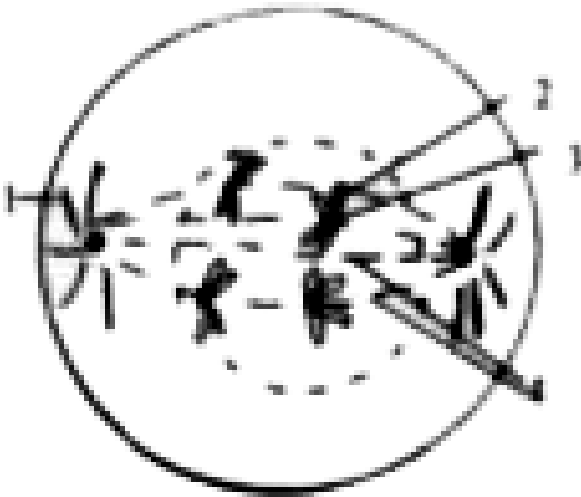


Name the parts labelled 1, 2, 3 and 4.



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96. Given diagram representing a stage during mitotic cell division in an animal cell:

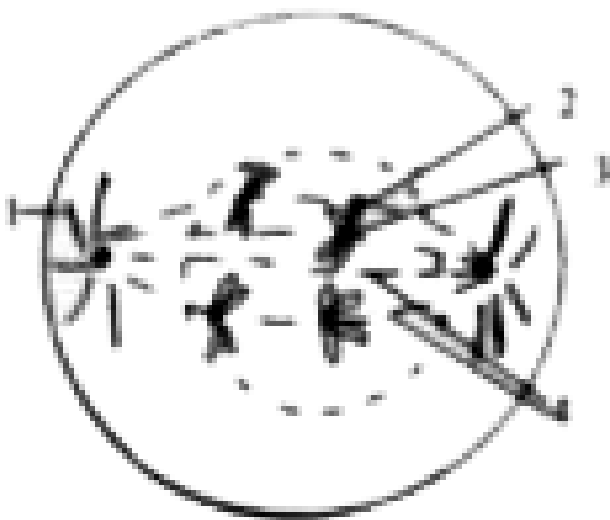


What is the function of part 3?



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97. Given diagram representing a stage during mitotic cell division in an animal cell:



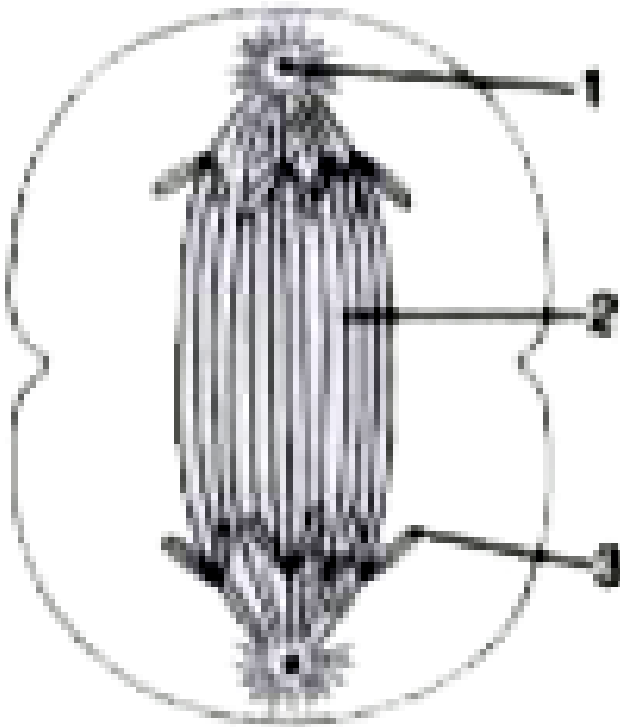
Name the stage that comes just after the stage shown in the diagram. Draw a well labelled diagram of this stage.



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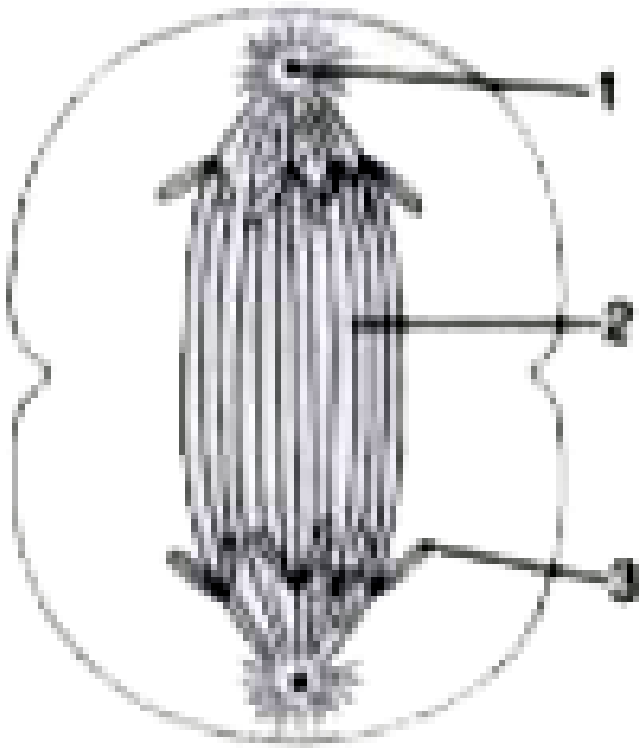
98. The diagram given below represents a stage during cell division. Study the same and then answer the questions that follow :



Name the parts labelled 1, 2 and 3.



**99.** The diagram given below represents a stage during cell division. Study the same and then answer the questions that follow :

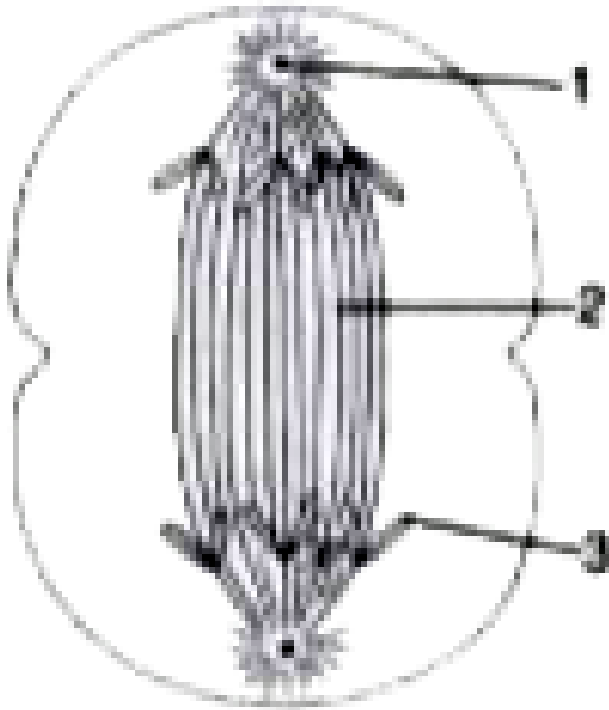


Identify the above stage and give a reason to support your answer.



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**100.** The diagram given below represents a stage during cell division. Study the same and then answer the questions that follow :

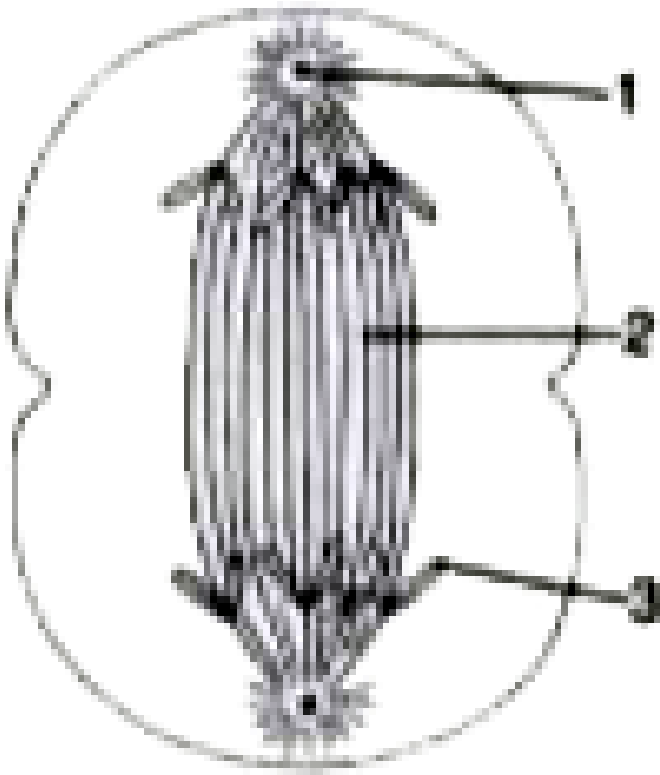


Mention where in the body this type of cell division occurs.



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**101.** The diagram given below represents a stage during cell division. Study the same and then answer the questions that follow :



Name the stage prior to this stage and draw a diagram to represent the same.



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**102.** Draw a well labelled diagram to show the anaphase stage of mitosis in a plant cell having four chromosomes.



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**103.** Rewrite the terms in correct order so as to be in a logical sequence. Metaphase, Telophase, Prophase, Anaphase, Cytokinesis.



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**104.** Briefly explain the following term :

Cytokinesis in plants



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**105.** Write the names of four nitrogenous bases in a DNA molecule.



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**106.** Given below is a diagram representing a stage during mitotic cell division.

Study it carefully and answer the questions that follow:



Is it a plant cell or an animal cell? Give a reason to support your answer.



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**107.** Given below is a diagram representing a stage during mitotic cell division.

Study it carefully and answer the questions that follow:



Identify the stage shown above.



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**108.** Given below is a diagram representing a stage during mitotic cell division.

Study it carefully and answer the questions that follow:



Identify the stage shown above.



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**109.** Given below is a diagram representing a stage during mitotic cell division.

Study it carefully and answer the questions that follow:



How will you differentiate between mitosis and meiosis on the basis of the chromosome number in the daughter cells?



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**110.** Given below is a diagram representing a stage during mitotic cell division.

Study it carefully and answer the questions that follow:



Draw a duplicated chromosome and label its parts.



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**111.** Name the cell organelle/component which is visible only in cell division stages

- A. Mitochondria
- B. Chloroplast
- C. Chromosome
- D. Chromatin

**Answer:**



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**112.** After mitotic division, a female human cell will have

- A. 44 + XX chromosome
- B. 44 + XY Chromosome
- C. 22 + X Chromosome
- D. 22 + Y Chromosome

**Answer:**



**113.** The chromosomes get aligned at the equator during

A. Metaphase

B. Anaphase

C. Prophase

D. Telophase

**Answer:**





**114.** In 'S' phase of the cell cycle

A. RNA

B. RNA and proteins

C. DNA

D. Glucose

**Answer:**



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**115.** In a human male, a sperm will contain:

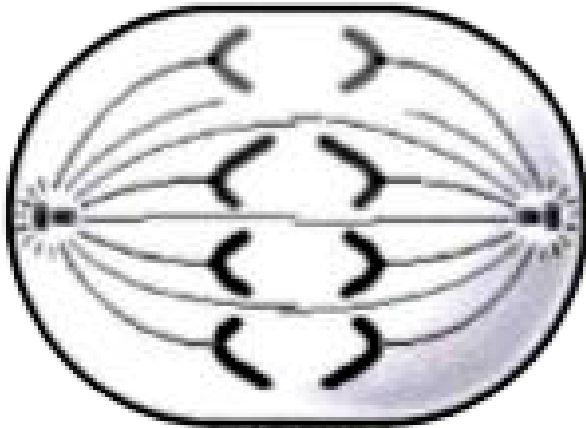
- A. Both X and Y chromosomes
- B. Only Y chromosome
- C. Only X chromosome
- D. Either X or Y chromosome

**Answer:**



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**116.** Given below is a diagram representing a stage during the mitotic cell division. Study the diagram and answer the following questions :

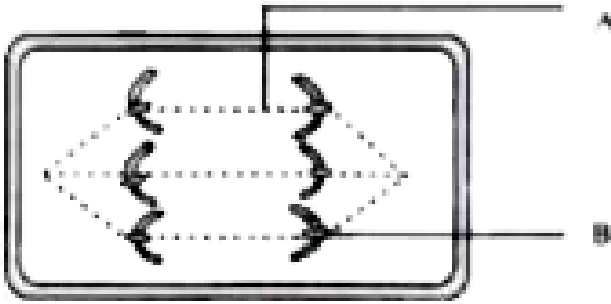


Identify the stage by giving a suitable reason.



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**117.** The diagram given below represents a certain stage of mitosis :

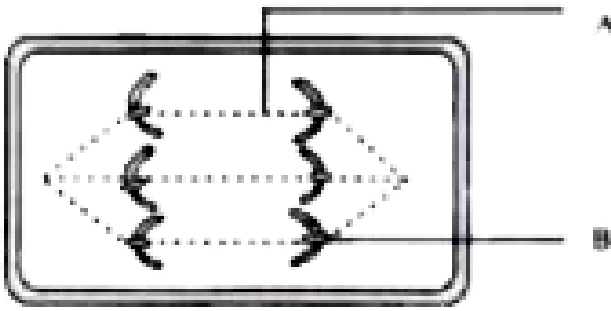


What is the unique feature observed in this stage?



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**118.** The diagram given below represents a certain stage of mitosis :

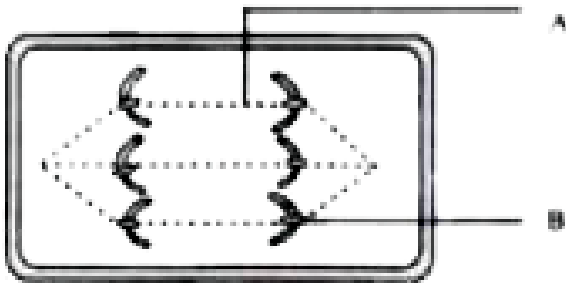


What is the unique feature observed in this stage?



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**119.** The diagram given below represents a certain stage of mitosis :

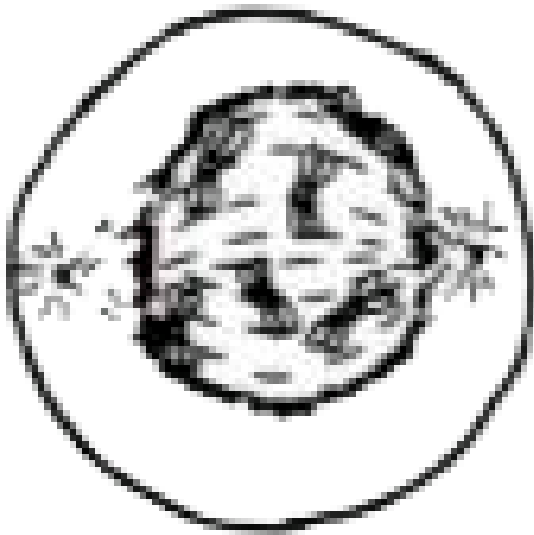


How many daughter cells are formed from this type of cell division?



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**120.** The given diagram shows a stage during mitotic division in an animal cell:



Identify the stage. Give a reason to support your answer.

A. Draw a neat labelled diagram of the cell as it would appear in the next stage.

Name the stage.

B.

C.

D.

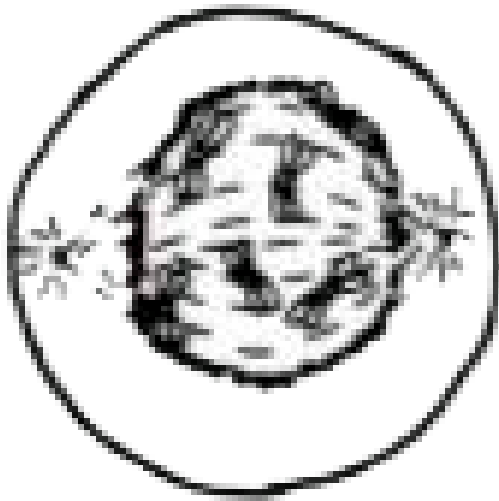
**Answer:**



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**121.** The given diagram shows a stage during mitotic division in an animal cell:



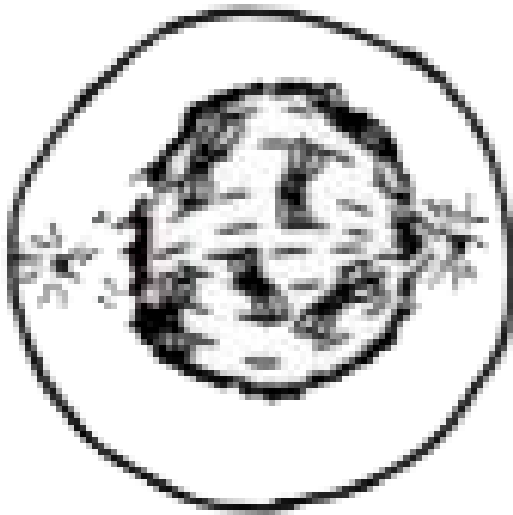


Draw a neat labelled diagram of the cell as it would appear in the next stage. Name the stage.



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122. The given diagram shows a stage during mitotic division in an animal cell:



In what two ways is mitotic division in an animal cell different from the mitotic division in a plant cell?



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**123.** The given diagram shows a stage during mitotic division in an animal cell:



Name the type of cell division that occurs during:

A. Growth of a shoot

B. Formation of pollen grains.



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**124.** Given below are groups of terms. In each group the first pair indicates the relationship between the two terms. Rewrite and complete the second pair on a similar basis.

Cytoplasm : Cytokinesis :: Nucleus :



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**125.** In each set of terms given below, there is an odd one and cannot be grouped in the same category to which the other three belong. Identify the odd term in each set and name the category to which the remaining three belong.

Example: Ovary, Fallopian tube, Ureter, Uterus.

Odd term : Ureter

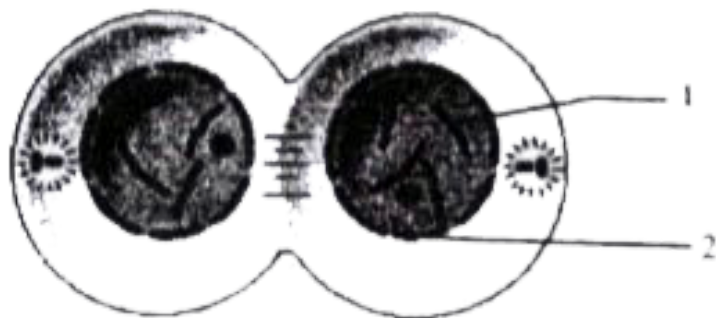
Category: Parts of female reproductive system.

Thymine, Cytosine, Adenine, Pepsin.



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**126.** Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow:

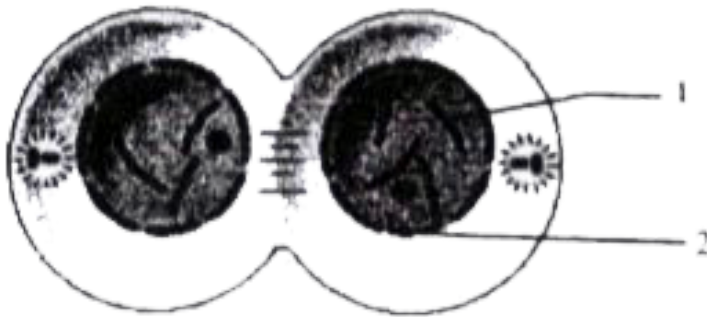


Identify the stage giving suitable reasons.



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127. Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow:

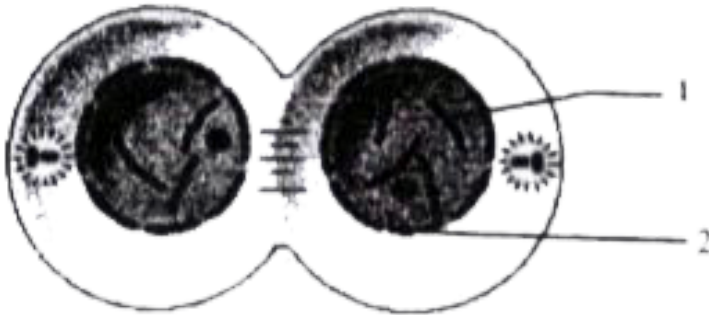


Name the parts numbered 1 and 2.



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**128.** Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow:



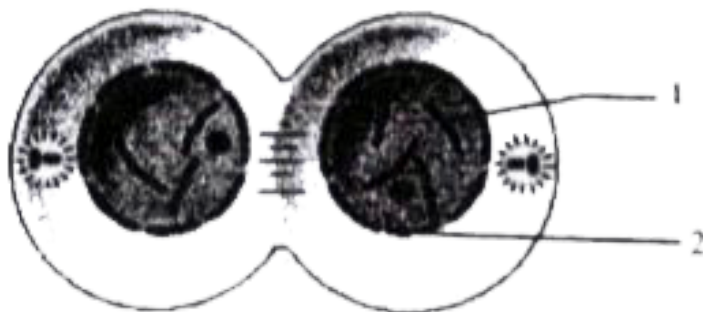
What is the technical term for the division of nucleus?



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**129.** Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow:

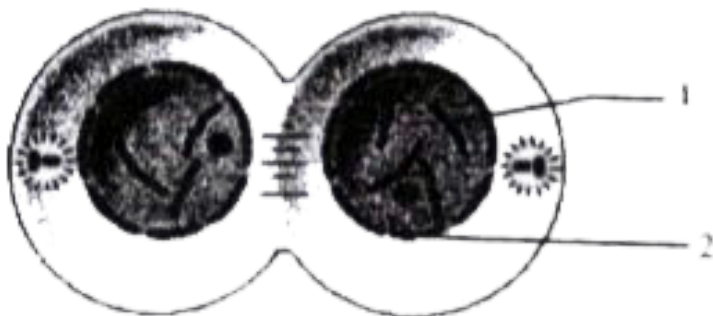


Mention the stage that comes before the stage shown in the diagram. Draw a neat labelled diagram of the stage mentioned.



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**130.** Study the diagram given below which represents a stage during the mitotic cell division and answer the questions that follow:



Which is the cell division that results in half the number of chromosomes in daughter cells?



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**131.** Correct the following statements by changing the underlined words:

(i) Normal pale yellow colour of the urine is due to the presence of the pigment Melanin.

(ii) The outermost layer of meninges is Piamater.

(iii) The cell sap of root hairs is Hypotonic.

(iv) Xylem transports starch from the leaves to all parts of the plant body.

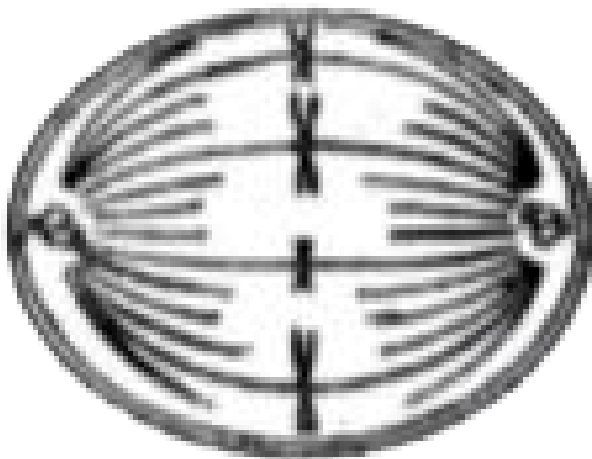
(v) Nitrogen bonds are present between the complementary nitrogen bases of DNA.



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**132.** The diagram given below represents a stage during cell division

Study the same and answer the questions that follow :



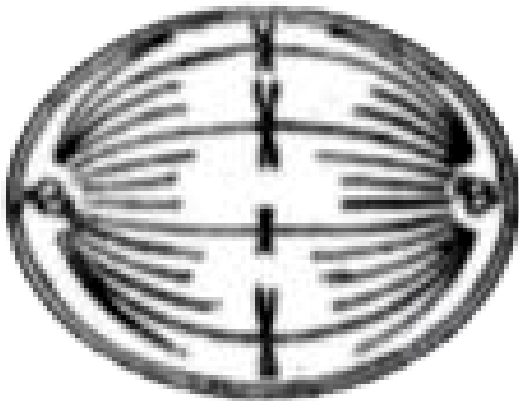
Identify whether it is a plant cell or an animal cell. Give a reason in support of your answer.



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**133.** The diagram given below represents a stage during cell division

Study the same and answer the questions that follow :



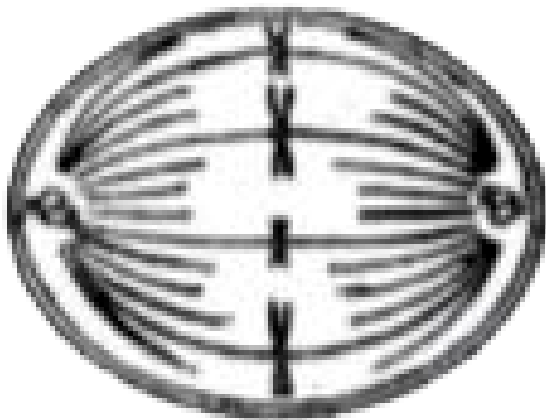
Name the stage depicted in the diagram. What is the unique feature observed in this stage?



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**134.** The diagram given below represents a stage during cell division

Study the same and answer the questions that follow :



Name the type of cell division that occurs

during:

Replacement of old leaves by new ones.

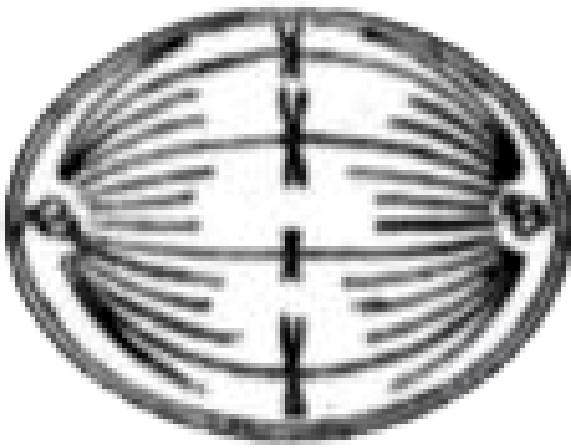
Formation of gametes



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**135.** The diagram given below represents a stage during cell division

Study the same and answer the questions that follow :



What is the stage that comes before the stage shown in the diagram ?



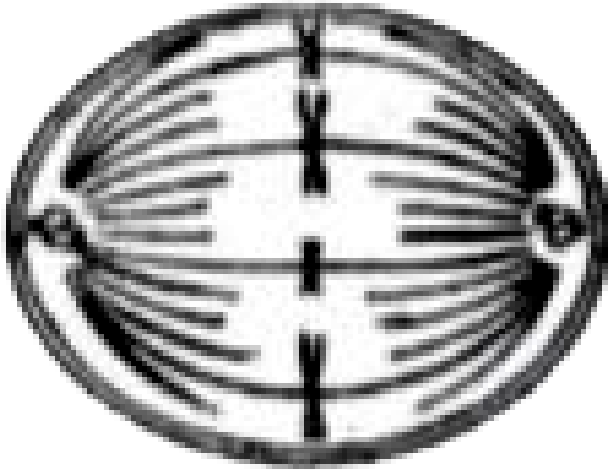
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**136.** The diagram given below represents a stage during cell division

Study the same and answer the questions that



follow :



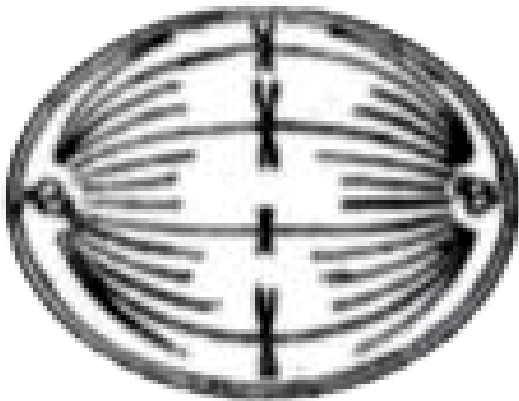
Draw a neat, labelled diagram of the stage mentioned in.



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**137.** The diagram given below represents a stage during cell division

Study the same and answer the questions that follow :



Name the stage depicted in the diagram. What is the unique feature observed in this stage?



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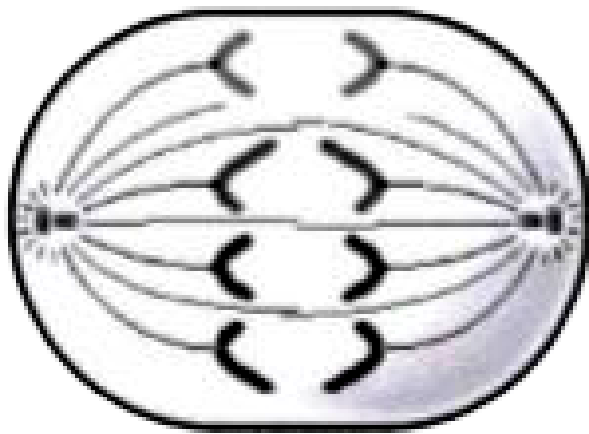
**138.** Give appropriate biological or technical terms for the following:

The complex consisting of a DNA strand and a core of histones.



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**139.** Given below is a diagram representing a stage during the mitotic cell division. Study the diagram and answer the following questions :

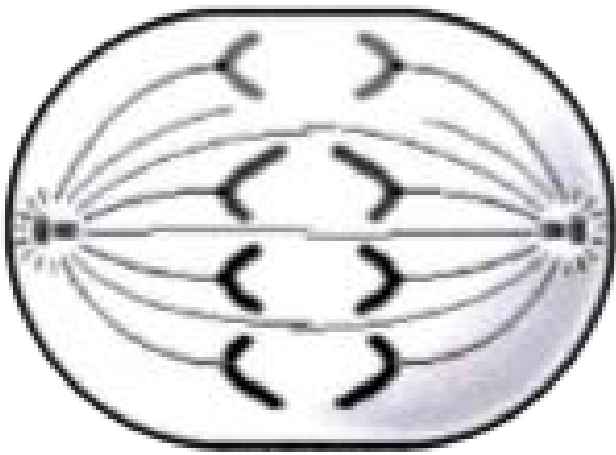


Identify the stage by giving a suitable reason.



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**140.** Given below is a diagram representing a stage during the mitotic cell division. Study the diagram and answer the following questions :



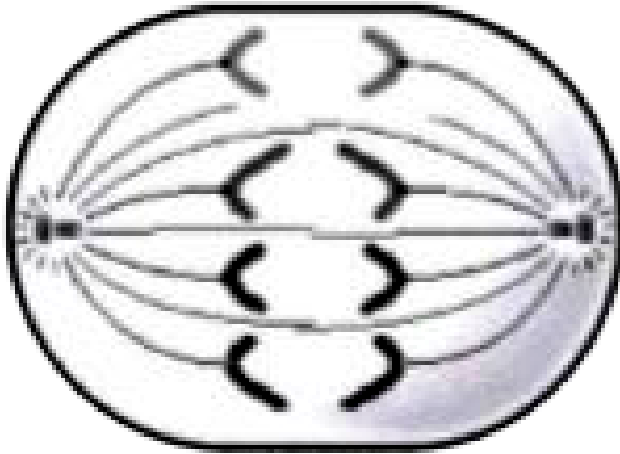
Is it a plant or an animal cell? Give a reason to support your answer.



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**141.** Given below is a diagram representing a stage during the mitotic cell division. Study the diagram and answer the following

questions :



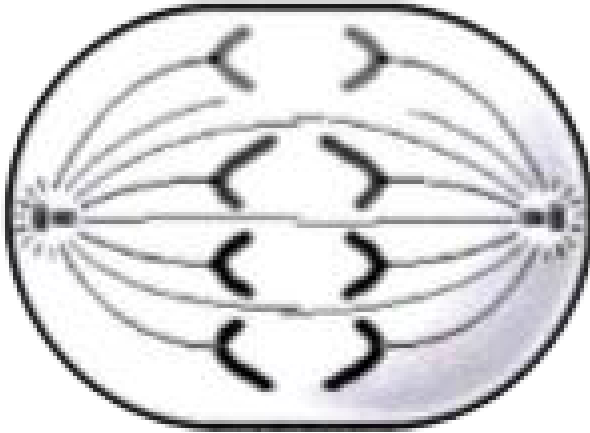
Draw a neat, labelled diagram of the stage which follows the one shown in the diagram.



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**142.** Given below is a diagram representing a stage during the mitotic cell division. Study

the diagram and answer the following questions :

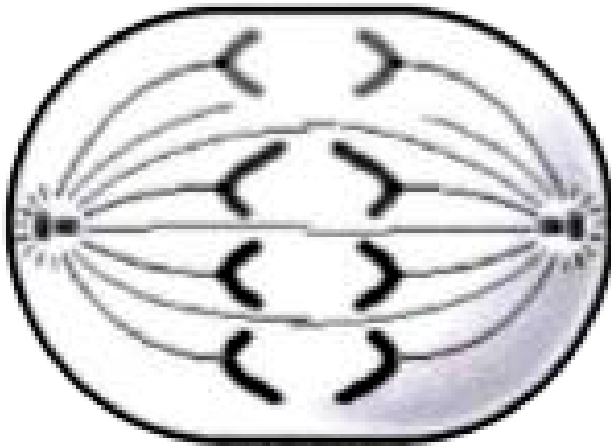


How many chromosomes will each daughter cell have after the completion of the above division ?



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**143.** Given below is a diagram representing a stage during the mitotic cell division. Study the diagram and answer the following questions :



Name the four nitrogenous bases.



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