YAKEEN NEET 2.0

2026

Cell Cycle and Cell Division

Botany | Lecture - 04

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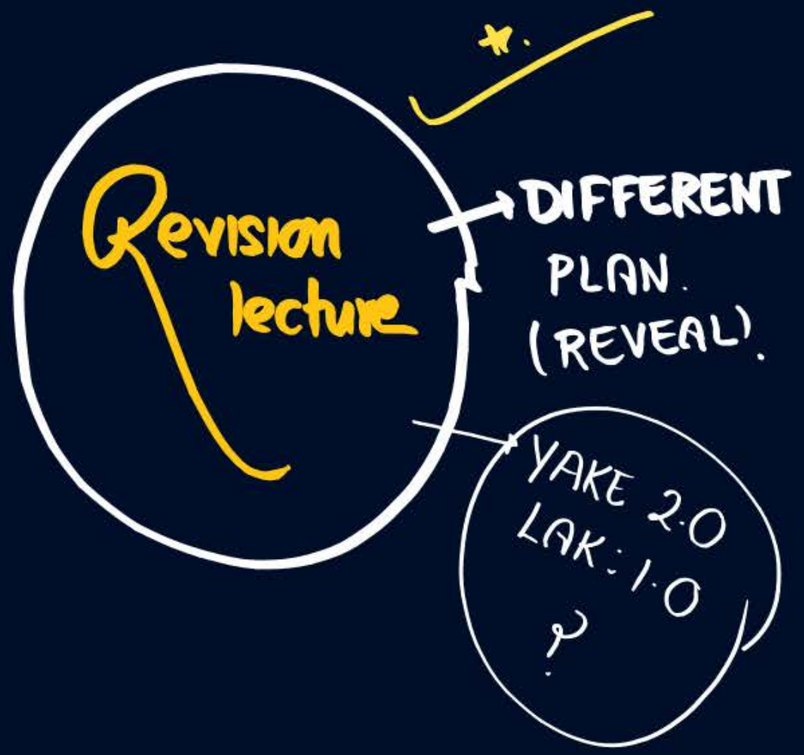
Topics to be covered

1. CYTOKINESIS
2. MEIOSIS-I (PROPHASE-I).
3.
4.

PROMISE : SATURDAY

NCERT BOOSTER
DISCUSS IN CLASS.



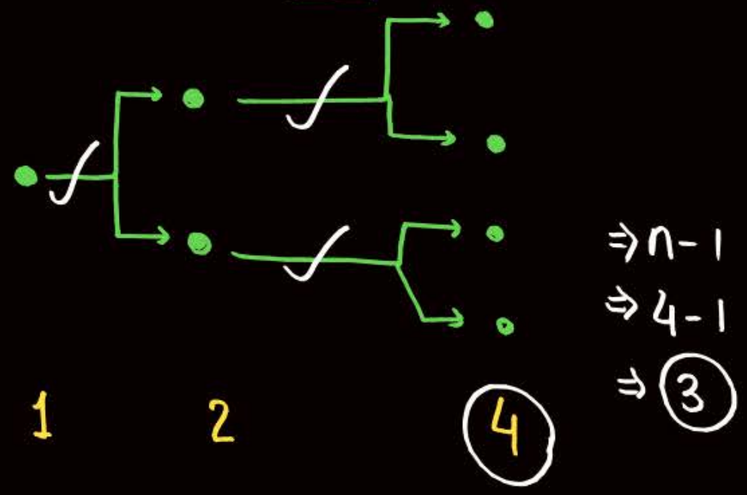
Q. NO. OF GEN^N REQUIRE FOR FORM^N OF 64 cell. (2^n).

1 → 2 → 4 → 8 → 16 → 32 → 64

Ans: (6)

Q NO. OF MITOTIC DIVISION FOR 64 CELL $(n-1)$

⇒ 64-1 ⇒ 63



⇒ n-1
⇒ 4-1
⇒ 3

CYTOKINESIS

MITOSIS / CELL DIVISION

KARYOKINESIS

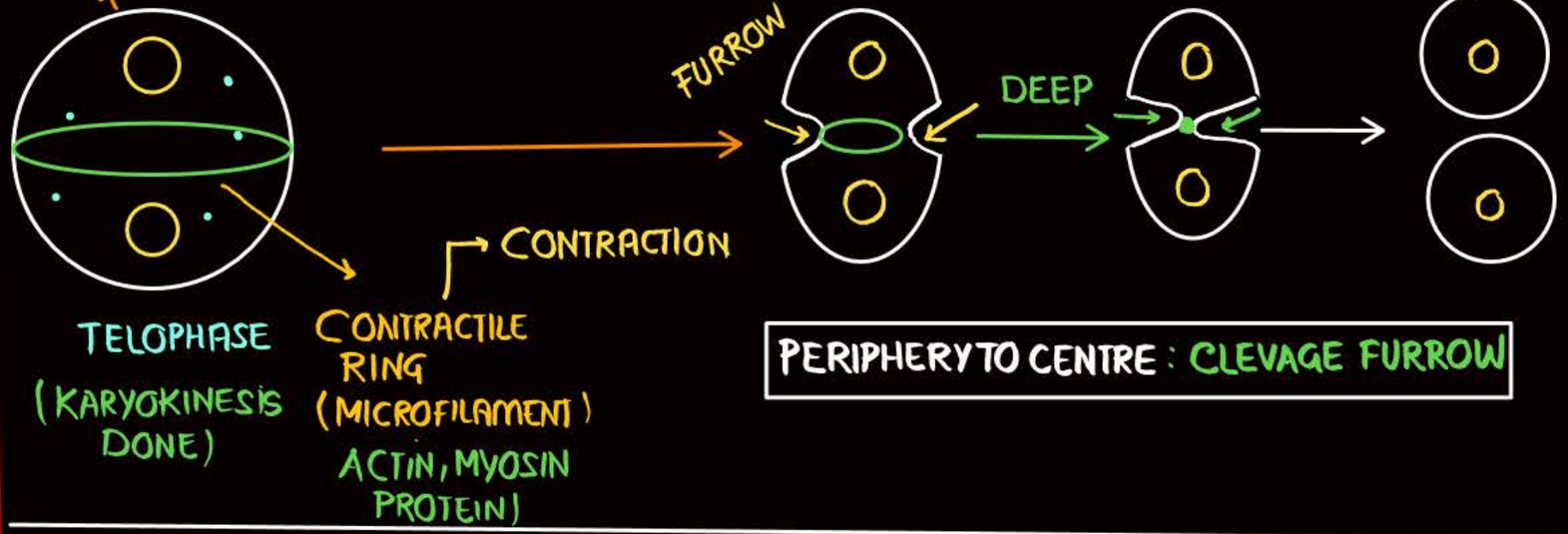
⇒ DUPLICATED CHROMOSOME (DNA) EQUALLY DISTRIBUTE IN TWO DAUGHTER NUCLEUS.

CYTOKINESIS

⇒ DISTRIBUTED CYTOPLASM (CELL ORGANELLE) IN TWO CELL

ANIMAL

CELL MEMBRANE



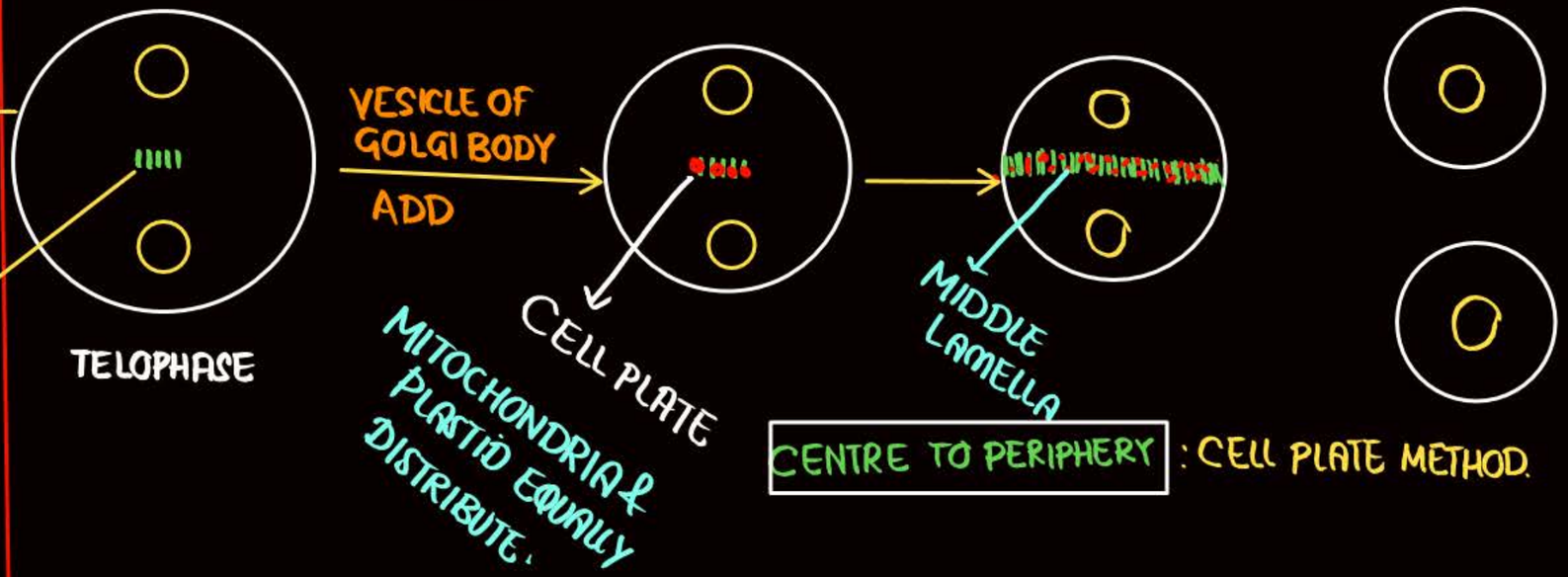
PERIPHERY TO CENTRE : CLEVAGE FURROW

PLANT

(HARD) CELL WALL

(INEXTINSABLE) NOT ABLE TO STRECH

MICROTUBUE (EQUATOR) PHRAGMOPLAST



CENTRE TO PERIPHERY : CELL PLATE METHOD.

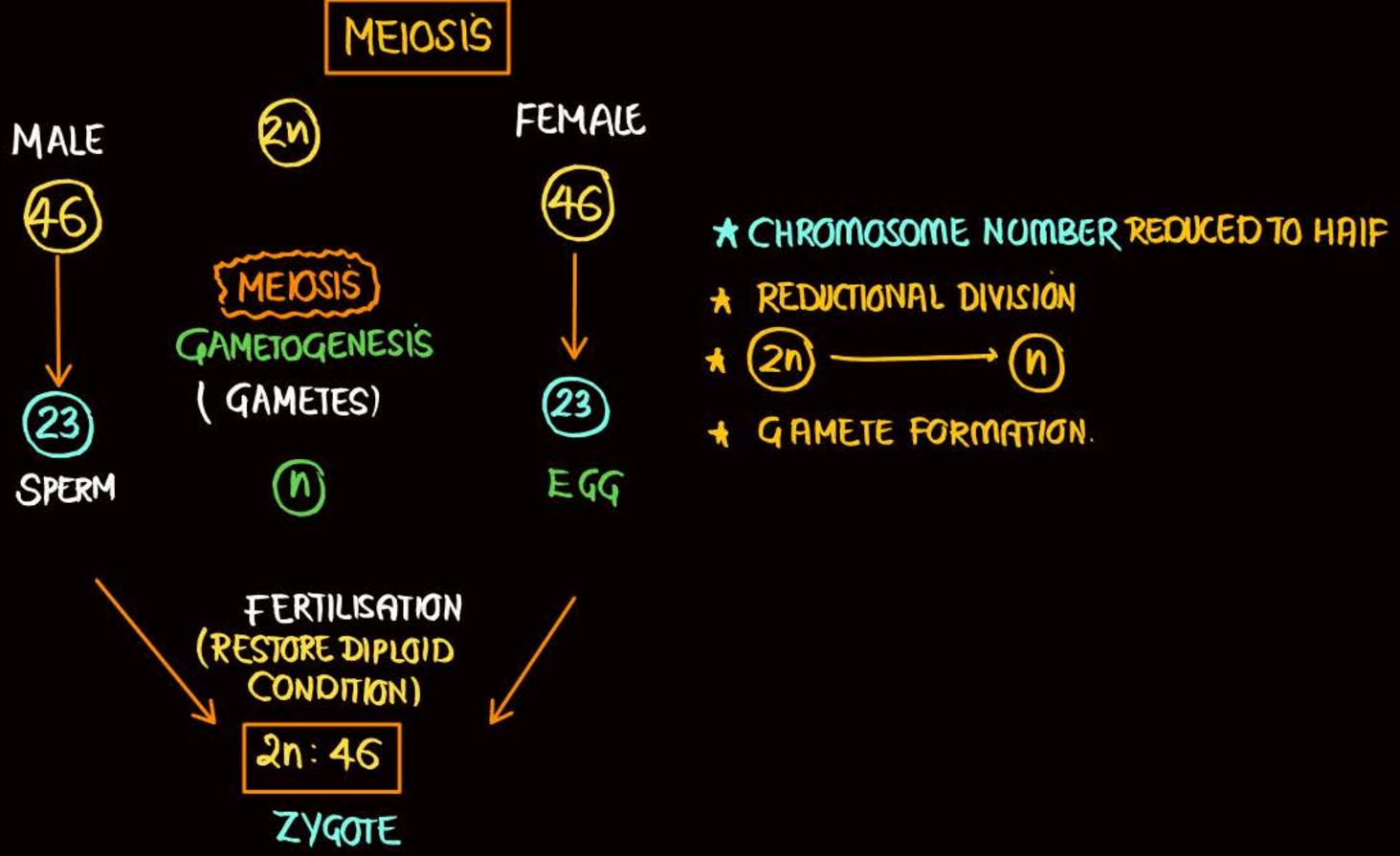
NOTE

(K) (C)
KARYOKINESIS NOT FOLLOWED BY CYTOKINESIS

MULTINUCLEATED CONDITION ARISE:

SYNCYTIUM.

eg: LIQUID IN COCONUT (ENDOSPERM)



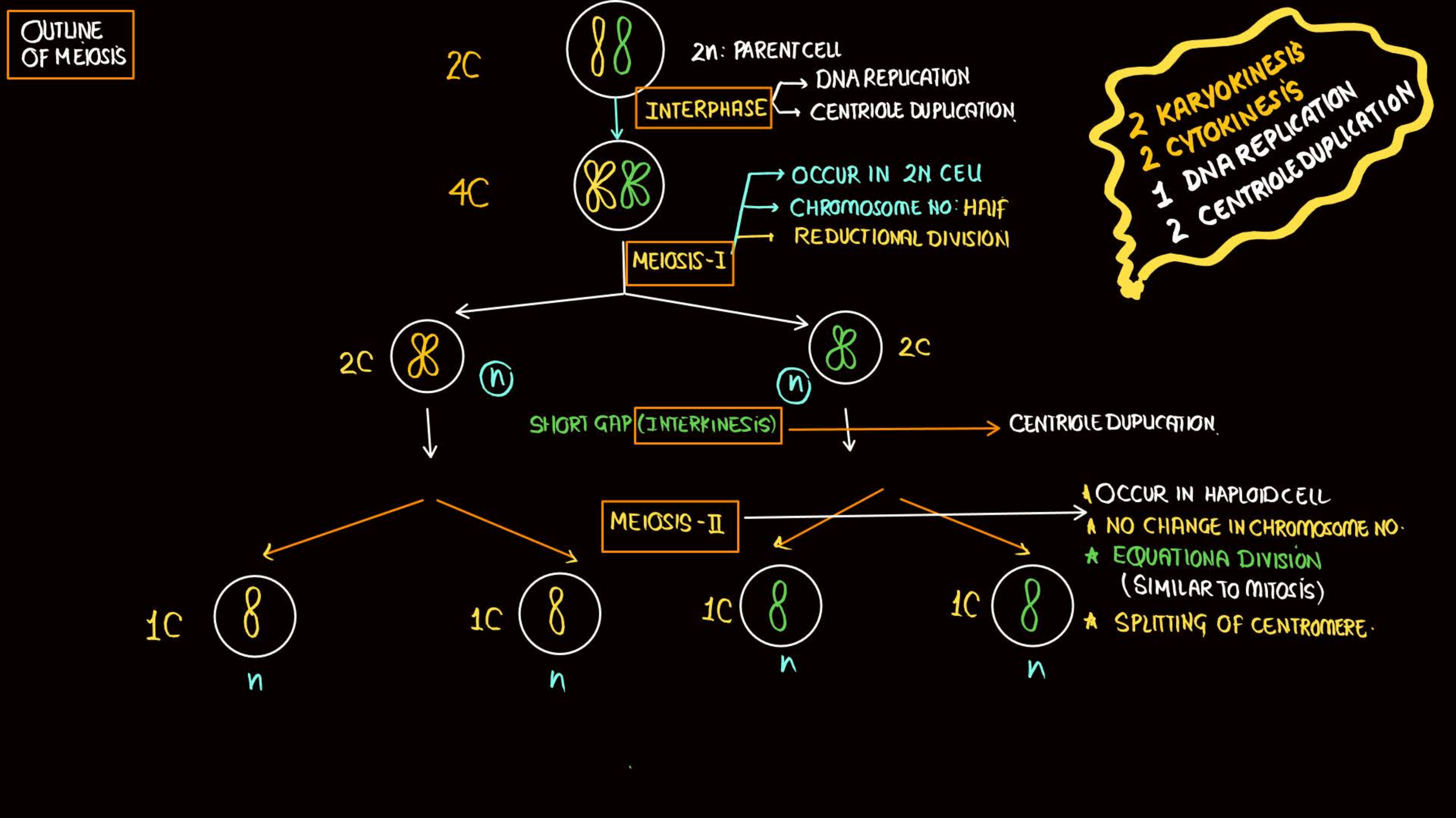
★ CHROMOSOME NUMBER REDUCED TO HALF

★ REDUCTIONAL DIVISION

★ 2n ⟶ n

★ GAMETE FORMATION.

OUTLINE OF MEIOSIS



Q. PARENT CELL: 40 CHROMOSOME

G_2 : 40

MEIOSIS-I 20 (1 CHROMOSOME: 2 CHROMATID)

MEIOSIS-II 20 (1 CHROMOSOME: 1 CHROMATID)

Q MEIOSIS-II : 100 CHROMOSOME IN EACH CELL

$G_1 \rightarrow$ 200

MEIOSIS-I $\longrightarrow$ 100

MEIOSIS-II $\longrightarrow$ 100

Q PARENT CELL: 40 Pg DNA

G_2 : 80

MEIOSIS-I : 40

MEIOSIS-II : 20

Q PARENT : 2C

G_1 : 2C / 20

S : 4C / 40

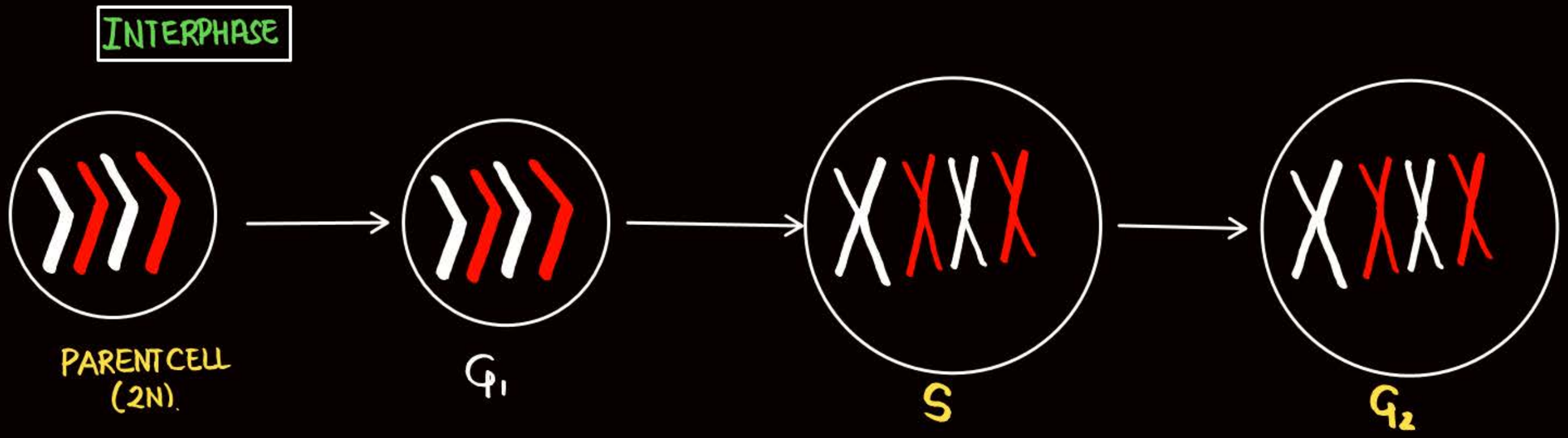
G_2 : 4C / 40

M-I : 2C / 20

M-II : 1C / 10

Q MEIOSIS-II : 10Pg

G_1 : 20 ✓


INTERPHASE
PARENT CELL
(2N)
G1
S
G2

	NO. OF CHROMOSOME	DNA AMOUNT	NO. OF CHROMATID IN ONE CHROMOSOME	
PARENT CELL	4	2C	1	
G_1	4	2C	1	INTERPHASE.
S	4	4C	2	
G_2	4	4C	2	

PROPHASE-I
METAPHASE-I
ANAPHASE-I
TELOPHASE-I / MEIOSIS-I

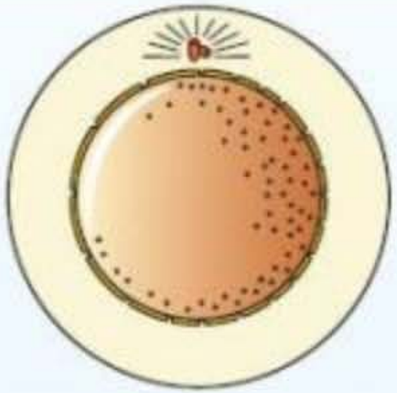
PROPHASE-II
METAPHASE-II
ANAPHASE-II
TELOPHASE-II / MEIOSIS-II

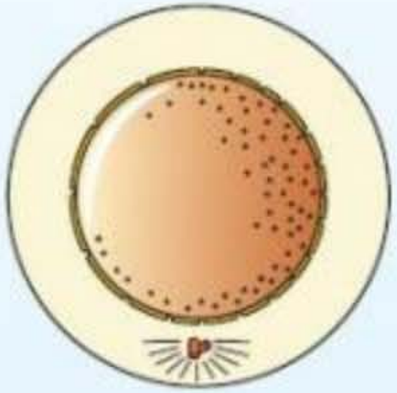
10.2.5 Cytokinesis

Mitosis accomplishes not only the segregation of duplicated chromosomes into daughter nuclei (karyokinesis), but the cell itself is divided into two daughter cells by the separation of cytoplasm called cytokinesis at the end of which cell division gets completed (Figure 10.2 e). 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. Plant cells however, are enclosed by a relatively inextensible cell wall, thererfore they undergo cytokinesis by a different mechanism.

In plant cells, wall formation starts in the centre of the cell and grows outward to meet the existing lateral walls. The formation of the new cell wall begins with the formation of a simple precursor, called the **cell-plate** that represents the middle lamella between the walls of two adjacent cells. At the time of cytoplasmic division, organelles like mitochondria and plastids get distributed between the two daughter cells. In some organisms karyokinesis is not followed by cytokinesis as a result of which multinucleate condition arises leading to the formation of syncytium (e.g., liquid endosperm in coconut).

CENTRE TO PERIPHERY.





Interphase

(e)

Figure 10.2 c to e : A diagrammatic view of stages in Mitosis

Homework from YAKEEN NEET 2.0 2026 Module

EX-3

1, 6, 7, 8, 11, 12,

EX-4.

6, 7, 9, 11, 12, 13, 14, 15,
18, 19, 24, 23 (PRIOR TO FISSION)
27, 34, 35,

THANK YOU