

YAKEEN NEET 2.0

2026

Cell Cycle and Cell Division

Botany

Lecture - 01

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Topics to be covered

1

CELL CYCLE

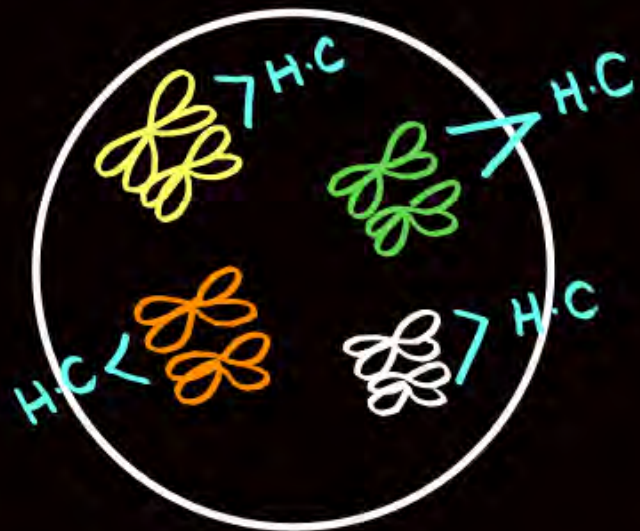
2

3

4

BASIC CONCEPT

DIPLOID



★ TWO COPY OF EACH CHROMOSOME

★ $2n: 46$

★ 23 PAIRS

eg: SKIN CELL

★ CHROMOSOME OF SAME PAIR: HOMO-LOGOUS CHROMOSOME

★ CHROMOSOME FROM DIFFERENT PAIR: NON HOMOLOGOUS.

HAPLOID

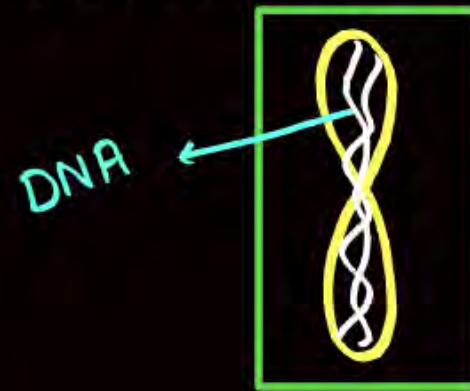


★ ONE COPY OF EACH CHROMOSOME

★ $n: 23$

eg: SPERM/EGG (GAMETES)

CHROMOSOME



NO. OF CHROMOSOME

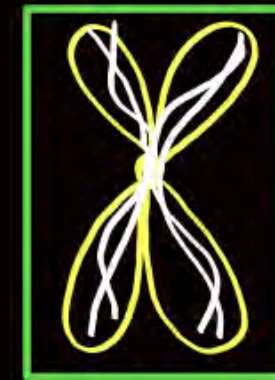
ONE

CHROMATID

ONE

DNA

LESS



ONE

TWO

MORE

BASIC CONCEPT OF CELL CYCLE

★ INTERPHASE + M PHASE = CELL CYCLE.

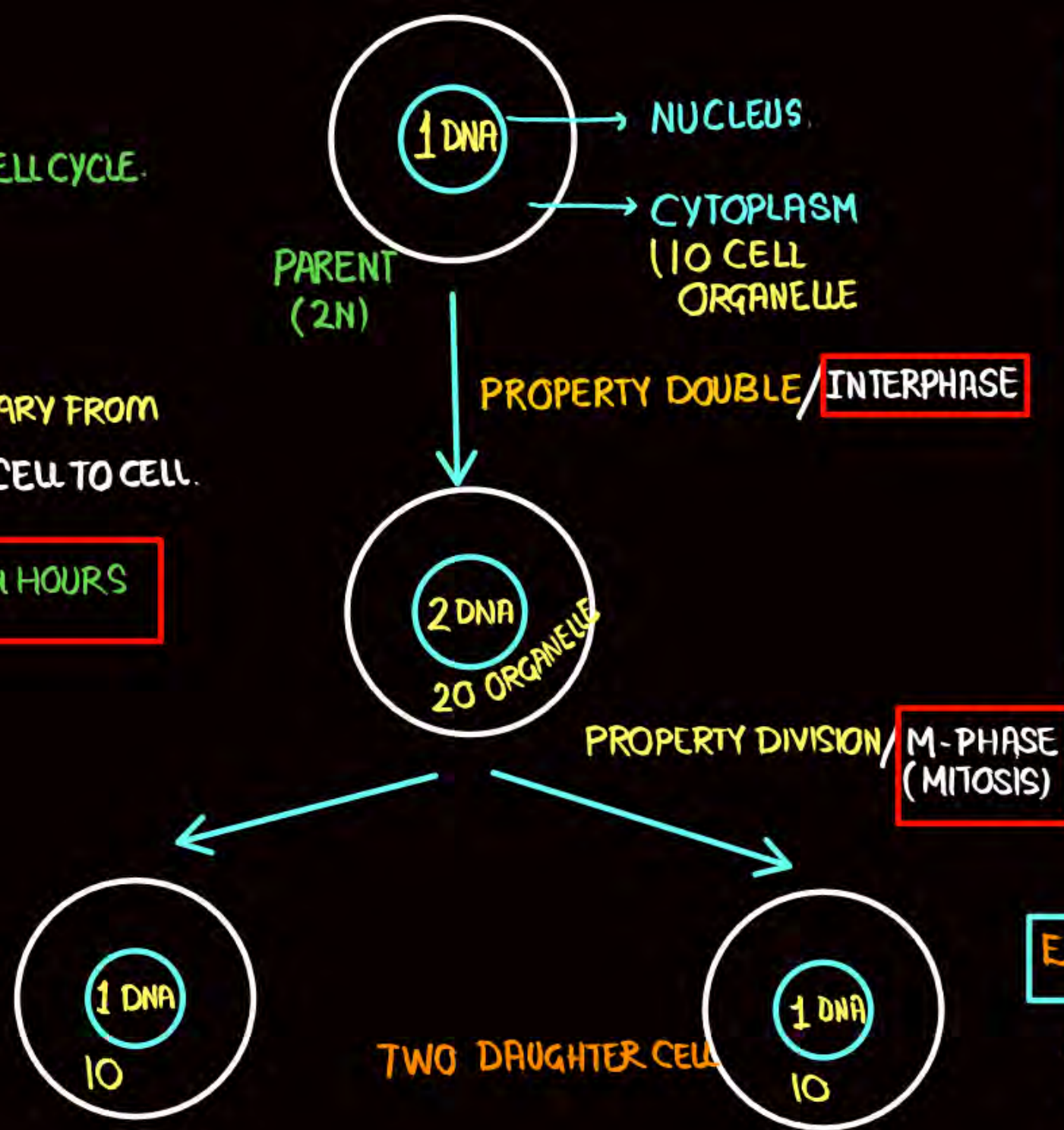
★ >95% + <5

★ LONG SHORT

★ DURATION OF CELL CYCLE VARY FROM ORGANISM TO ORGANISM / CELL TO CELL.

★ 23 HOURS + 1 HOUR \Rightarrow 24 HOURS

★ YEAST: 90 MINUTES.



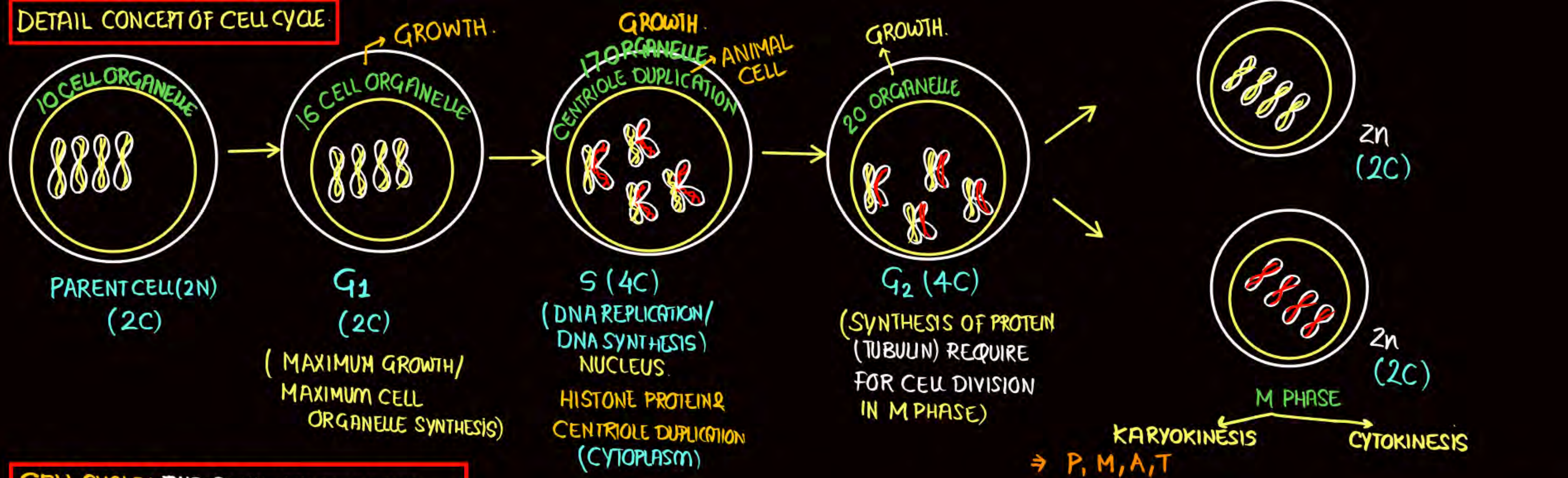
- ★ **NON-DIVIDING PHASE**
- ★ **RESTING PHASE** (CELL IS NOT DIVIDING)
- ★ **CELL METABOLICALLY ACTIVE**
- ★ **CONTINUOUS SYNTHESIS CONTENT OF NUCLEUS & CYTOPLASM. (CONTINUOUSLY GROWTH)**
- ★ **DIVIDED INTO THREE PHASE**
 - ① G₁ / GAP-1
 - ② S / SYNTHESIS
 - ③ G₂ / GAP-2

KARYOKINESIS : DIVISION OF NUCLEUS
CYTOKINESIS : DIVISION OF CYTOPLASM

EQUATIONAL DIVISION

CHROMOSOMAL / DNA CONTENT SAME IN BOTH PARENT & DAUGHTER CELL.

DETAIL CONCEPT OF CELL CYCLE



CELL CYCLE: THE SEQUENCE OF EVENTS BY WHICH CELL DUPLICATE ITS GENOME (DNA) & OTHER CONSTITUENT (CELL ORGANELLE) → **INTERPHASE** AND DISTRIBUTE EQUALLY IN TWO DAUGHTER CELL BY COMPLEX SERIES OF EVENTS → **M PHASE** (PROPHASE, METAPHASE, ANAPHASE, TELOPHASE) → **KARYOKINESIS**

NOTE: NO CHANGE IN CHROMOSOME NUMBER BUT DNA AMOUNT DOUBLE.

NOTE: CHROMOSOME DUPLICATION (DNA REPLICATION)

NOTE: GROWTH IS CONTINUOUS PROCESS (G₁ → S → G₂)

| | NO. OF CHROMOSOME | DNA AMOUNT | NO. OF CHROMATID IN ONE CHROMOSOME |
|----------------|-------------------|------------|------------------------------------|
| PARENT CELL | 2n = 4 | 2C | 1 |
| G ₁ | 2n = 4 | 2C | 1 |
| S | 2n = 4 | 4C | 2 |
| G ₂ | 2n = 4 | 4C | 2 |
| M PHASE | 2n = 4 | 2C | 1 |

Q PARENT CELL: 20 CHROMOSOME, 10 Pg DNA.

$G_1 = 20, 10$

$S = 20, 20$

$G_2 = 20, 20$

$M = 20, 10$

Q NO. OF CHROMATID: 10 IN G_1
NO. OF CHROMOSOME IN G_1

1 CHROMATID = 1 CHROMOSOME

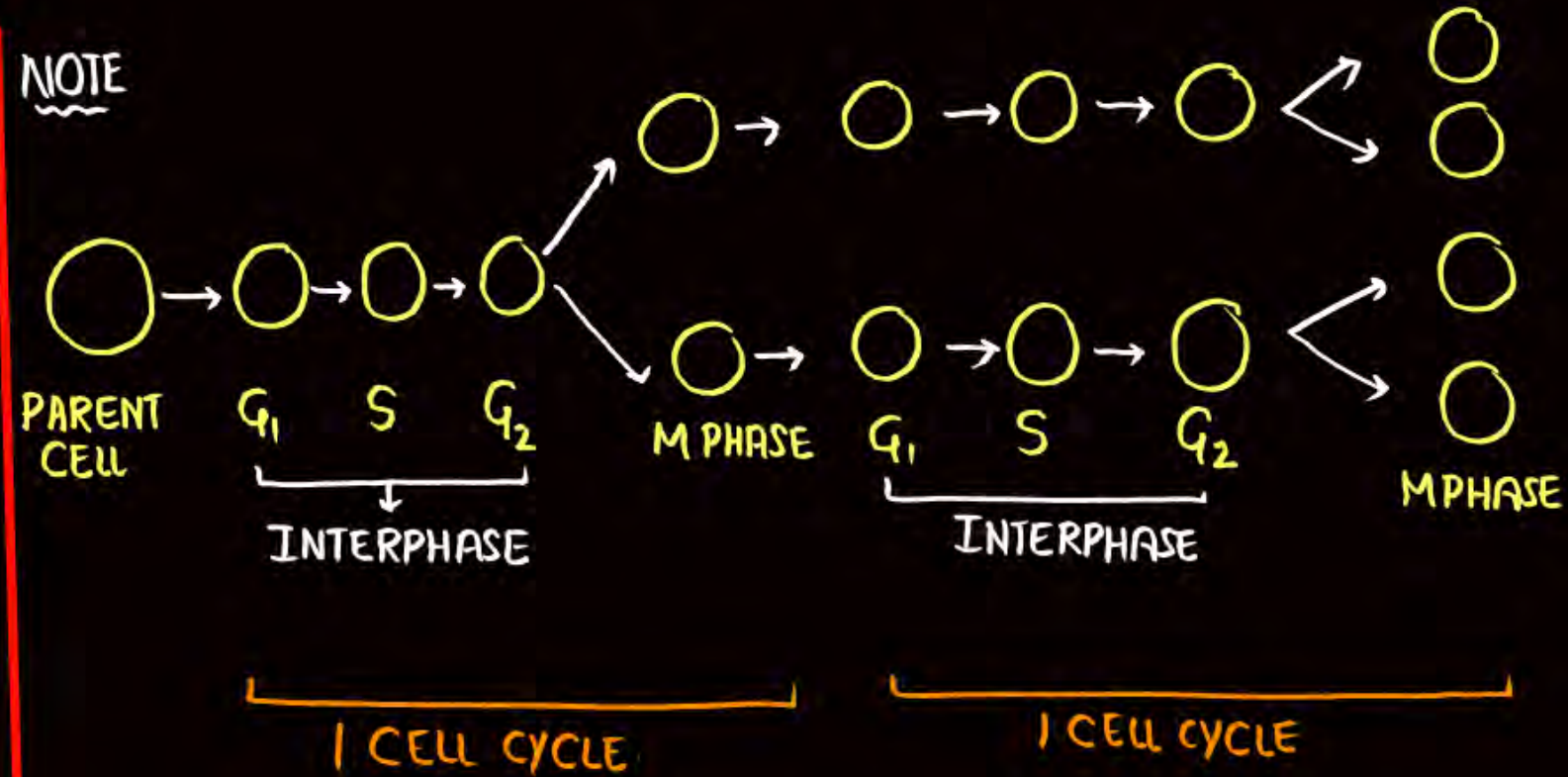
10 CHROMATID = 10 CHROMOSOME

Q NO. OF CHROMATID: 10 IN S/G_2
NO. OF CHROMOSOME: 'S'

2 CHROMATID IN ONE CHROMOSOME

10 CHROMATID = 5 CHROMOSOME

NOTE



NOTE: B/W TWO M PHASE: INTERPHASE.

| G_1 | $S/$ | G_2 |
|-----------------------------|---|---------------------------|
| PRE-SYNTHESIS PHASE | SYNTHESIS PHASE | POST SYNTHESIS |
| POST-MITOTIC | | PRE-MITOTIC PHASE |
| MAX. GROWTH/METABOL. ACTIVE | G GROWTH | G GROWTH. |
| | DNA REPLICATION & CENTRIOLE DUPLICATION | PROTEIN FOR CELL DIVISION |
| $2n = 10$ CHROMOSOME | $2n = 10$ | $2n = 10$ |
| DNA = $2C$ | DNA = $4C$ | DNA = $4C$ |

THANK
YOU