

# Important Questions on Cell Cycle & Regulation



1. Some cells which are not able to divide further e.g., Nerve cells, in which phase of the cell cycle do they remain arrested?

- A. G<sub>0</sub> Phase
- B. G<sub>1</sub> Phase
- C. Prophase
- D. S Phase

2. Choose the true statement about M-Phase of Cell cycle.

- A. M -phase starts with Karyokinesis
- B. M-Phase starts with Cytokinesis
- C. No Karyokinesis occurs in M-Phase
- D. No Cytokinesis occurs in M-Phase

3. What is True about prophase in cell cycle:

- A. Formation of nucleolus and disruption of nuclear envelop
- B. Disruption of nucleolus and formation of nuclear envelop
- C. Nucleolus disappearance and disruption of nuclear envelop
- D. Nucleolus disappearance and formation of nuclear envelop

4. In cell cycle a protein structure at centromeric region of chromosome which interact with chromatin and is involved in attachment of microtubule is:

- A. Kinetochore
- B. CNP Protein
- C. CDK protein
- D. Alpha protein

5. In which phase of cell cycle chromatid is termed as chromosomes?

- A. Prophase
- B. Meta Phase
- C. Anaphase
- D. Telophase

6. When in some cell karyokinesis occurs and cytokinesis does not and cell becomes multinucleate cell is known as:

- A. Septate cell
- B. Coenocytic Cell
- C. Acellular cell
- D. None

7. Match the following and choose the option with correct match.

- I Colchicine
  - II Cytochalasin
  - III Taxol
  - IV P53
  - A) Microtubule formation
  - B) Induce cell cycle arrest
  - C) Inhibits Cytokinesis
  - D) Inhibits Microtubule formation
- Options.

- A. I-B, II-C, III-A, IV-D
- B. I-D, II-C, III-A, IV-B
- C. I-A, II-C, III-D, IV-B
- D. I-C, II-D, III-A, IV-B

8. Match the following and chose the correct option.

- I) Start of DNA Replication
  - II) Cell withdraw from Cycle
  - III) CDK
  - IV) Cytokinesis
  - A) Go phase
  - B) S phase
  - C) Division of cytoplasm
  - D) Control of cell cycle
- Option

- A. I-A, II-B, III-D, IV-C
- B. I-B, II-D, III-A, IV-C
- C. I-B, II-A, III-C, IV-D
- D. I-B, II-A, III-D, IV-C

9. Match The following

- I) Cyclin -CDKs complex
- II) CyclinA-CDK2 and Cyclin
- III) Cyclin B-CDK1
- IV) Cyclin E-CDK 2

- A) Trigger S Phase
  - B) Responsible for M Phase
  - C) Regulation the completion of S Phase
  - D) Transition from G1 to S
- Options
- A. I-D, II-C, III-B, IV-A
  - B. I-C, II-D, III-B, IV-A
  - C. I-D, II-C, III-A, IV-B
  - D. I-A, II-C, III-B, IV-D

10. In which organism during prophase of cell division, nuclear envelope remains intact?
- A. Fern
  - B. Elephant
  - C. Yeast
  - D. *E. coli*

### ANSWERS

- |     |     |     |      |     |     |
|-----|-----|-----|------|-----|-----|
| 1.A | 2.A | 3.C | 4.A  | 5.C | 6.B |
| 7.B | 8.D | 9.A | 10.C |     |     |

### SOLUTIONS

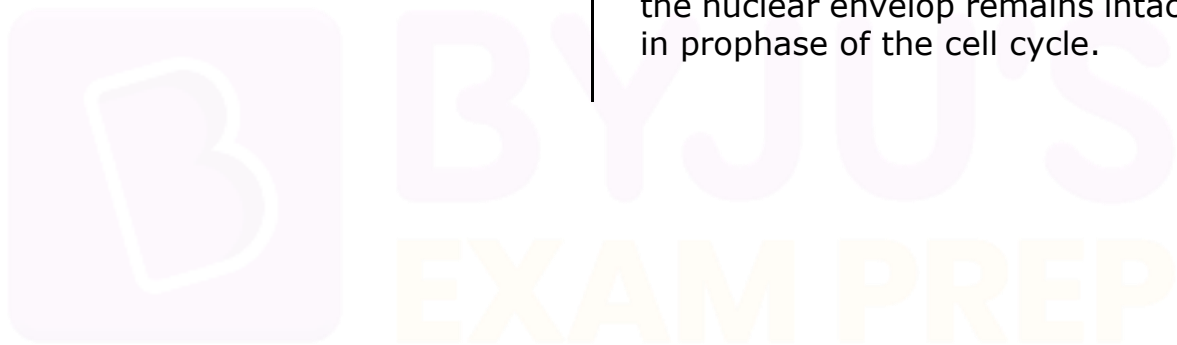
1. Neurons and some skeletal muscle cells in which division does not occur remain in G<sub>0</sub> phase (quiescent phase), when cell enters to G<sub>1</sub> phase it starts divide.
2. In cell division, the M phase or mitotic phase starts with karyokinesis (nuclear division) and form daughter nuclei and then cytokinesis occurs.
3. The end of prophase is marked with the disruption of nuclear envelope and nucleolus disappearance.
4. Kinetochore is a protein that assembles at centromeric region of chromosome, is involved in microtubule attachment, polymerisation and motor directed movements.

5. In anaphase, kinetochore microtubules pulls apart two kinetochores at opposite direction, cohesion protein degrades each chromatid which then move towards pole and are called as chromosome.
6. Coenocytic cell is formed when multiple nuclear division occurs without cytokinesis.
7. In active form p53 induce cell cycle arrest that allows repair of cell and apoptosis for discarding the damage. Colchicine is a drug that inhibits formation of microtubule; Taxol drug allows the formation of microtubule but prevent them for shortening and Cytochalasin is a drug which inhibits the process of cytokinesis.

8. In cell cycle S phase is known as the synthetic phase and is the stage when DNA replication takes place. When cell does not go for division, it re-enters the G<sub>0</sub> phase and withdraws from the cycle. CDK is cyclin dependent protein kinase and undergo synthesis and degradation in cell cycle involved in control of cell division, and cytokinesis is the process of cell division in which cytoplasm is divided.

9. Cyclins and CDKs (Cyclin dependent protein kinase) are regulatory components of the cell cycle, wherein Cyclin- CDK Complex trigger the transition from G<sub>1</sub> to S phase, CyclinA-CDK2 and Cyclin CyclinA-CDK1 involves in regulation of the completion of S phase, Cyclin B-CDK1 is responsible for M-phase and Cyclin E-CDK2 is trigger for initiation of S phase.

10. During prophase, disruption of nuclear envelop occurs but it is not a universal feature, in some lower eukaryotes like yeast and diatoms the nuclear envelop remains intact in prophase of the cell cycle.



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