**INDIAN SCHOOL AL WADI AL KABIR**

**UNIT TEST (2025 - 26)**

Class: XI Sub: BIOLOGY (044) Max.marks: 30
Date: 20.05.2025 SET 1 Time: 1 Hour

ANSWER KEY

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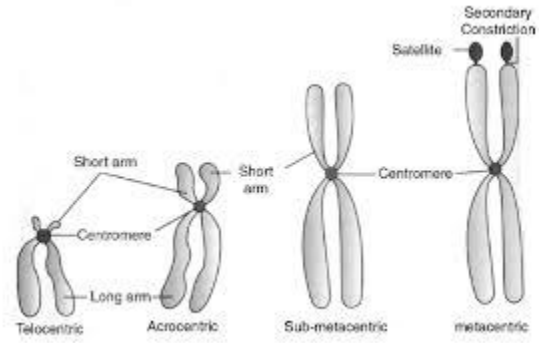
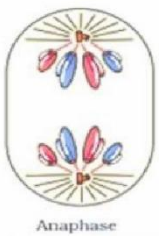
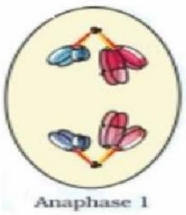
|---|---|---|
| | SECTION A | |
| 1 | D. Plasmodesmata | |
| 2. | C. Several ribosomes attached to single mRNA. | |
| 3. | C. Go | |
| 4. | D. Crossing over | |
| 5. | A. Both A and R are true and R is the correct explanation of A. | |
| 6. | A. Both A and R are true and R is the correct explanation of A. | |
| | SECTION B | |
| 7. |  | 2 |
| 8. | Eukaryotic cell ribosome: 80 S (60 S+ 40 S), Prokaryotic cell ribosome: 70 S (50 S + 30 S). It is the site of protein synthesis. | 2 |
| 9. | <u>Attempt either option A or B.</u><br>A.<br>  <br>  | 1+1 |

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| | <table><tr><th></th><th>Anaphase of mitosis</th><th>Anaphase I of meiosis</th></tr><tr><td>1.</td><td>Anaphase is the stage during which the centromere splits and the chromatids separate. The chromosomes move apart towards the opposite poles. These chromosomes are genetically identical.</td><td>During anaphase I, the homologous chromosomes separate, while the chromatids remain attached at their centromeres.<br>Hence, in anaphase I, the chromosomes of each bivalent pair separate, while the sister chromatids remain together.</td></tr></table><br>**OR**<br>B. **Cytokinesis in Plant Cells**:<br>- In plant cells, cytokinesis occurs through a process called **cell plate formation**.<br>- This process begins at the center of the cell, by the formation of a cell plate.<br>- The cell plate expands outward until it fuses with the existing cell membrane, resulting in the formation of two separate daughter cells, each with its own cell wall.<br>3. **Cytokinesis in Animal Cells**:<br>- In contrast, animal cells undergo cytokinesis through a mechanism known as the **cell furrow method**.<br>- This process starts at the periphery of the cell, where the plasma membrane begins to pinch inward, creating a furrow.<br>- The furrow deepens until the cell is pinched in two, resulting in two distinct daughter cells. | 1+1 |
| | SECTION C | |
| 10. | □ It is a double membrane-bound. The inner membrane encloses the stroma.<br>□ In stroma flattened membranous sacs (thylakoids) are present. These are arranged in stacks called grana.<br>□ Some flat membranous tubules (stroma lamellae) are also present which connect the thylakoids of the different grana.<br>□ The stroma contains double-stranded circular DNA, 70 S ribosomes and enzymes required for the synthesis of carbohydrates and proteins.<br>□ Functions: chloroplast is involved in Photosynthesis (Light reactions take place in granum, Dark reactions take place in stroma) and photorespiration.<br>Diagram | 3 |
| 11. | <u>Attempt either option A or B.</u><br>A.<br>(i) Fluid mosaic model of plasma membrane.<br>(ii) This fluidity is essential for: (Any two points)<br>o Cell growth<br>o Formation of intercellular junctions | 1+1+1 |

o Secretion
o Endocytosis
o Cell division
(iii) Polar molecules cannot pass through the lipid bilayer; they require a carrier protein of the membrane to facilitate their transport across the membrane.

**OR**

B. (i) The Golgi apparatus remains in close association with the endoplasmic reticulum because materials to be packaged in the form of vesicles from the ER fuse with the cis face of the Golgi apparatus and move towards the maturing face.
(ii) The cell organelle called the "suicidal bag" is the **Lysosome**. They are called this because they contain enzymes that can break down and digest the cell's own components, particularly when the cell is damaged or needs to be removed.
(iii) Mitochondria are the sites of aerobic respiration of eukaryotes because oxygen is utilised in mitochondria of eukaryotes during the production of cellular energy in the form of ATP.

12. A. (Any two points each) — 2+1

| | Meiosis | Mitosis |
|---|---|---|
| 1. | It is carried out in germ cells or gametic cells. | It is carried out in somatic cells. |
| 2. | It involves crossing over. | It does not involve crossing over. |
| 3. | It involves two division, first meiotic division and second meiotic division. | It involves one division. |
| 4. | Synapsis occurs leading to tetrad formation. | No synapsis occurs. |
| 5. | Number of daughter cells formed is four. | Number of daughter cells formed is two. |
| 6. | Interphase occurs only before first meiotic division and no interphase is seen before second meiotic division. | Each mitotic division is followed by interphase. |

B. Meiosis is necessary in sexually reproducing organisms because
i. It maintains the number of chromosomes constant in generation as meiosis is reductional division.
ii . It causes variations among the progeny because crossing over takes place during meiosis. This variation is important for evolution.

SECTION D

13. A. No. During the S phase, DNA synthesis or replication of DNA takes place. DNA replication is essential for cell division.
B. DNA copying which is also known as replication occurs during cell division. DNA replication is found to take place during the 'S' phase (synthesis phase) of the cell cycle.
C. **$G_1$ Phase or First Growth Phase or Post Mitotic Phase**
- New formed cells grow in size and are metabolically active.
- Active synthesis of RNA and proteins.
- Active in physiological functions.
- No replication of DNA occurs.

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| | G2 phase: - In this phase, proteins are synthesized & cell growth continues.<br>D. The chromosome number in the daughter cells is equal to the number of chromosomes in the parent cell hence mitosis is called equational division. | |
| | SECTION E | |
| 14. | A.<br>• **Prophase**<br>  • Chromosomes entangle and condense<br>  • Two chromatids attached to the centromere can be seen clearly<br>  • Each of the duplicated centrosomes radiates microtubules (asters)<br>  • Mitotic apparatus constitutes spindle fibres and asters<br>  • Golgi bodies, nucleolus, endoplasmic reticulum and nuclear membrane disappear<br>• **Metaphase**<br>  • Complete disintegration of the nuclear envelope<br>  • Two sister chromatids attached by the centromere aligned at the equator, i.e. metaphase plate<br>  • Each chromatid is attached to spindle fibres from opposite poles at kinetochores<br>• **Anaphase**<br>  • Splitting of centromere and two sister chromatids separate and go towards the opposite poles<br>  • Sister chromatids now become the daughter chromosomes<br>• **Telophase:**<br>  • Chromosomes cluster at opposite poles and decondense<br>  • Nuclear envelope develops around each cluster of chromosomes and two daughter nuclei are formed<br>  • The nucleolus, endoplasmic reticulum and Golgi apparatus are reformed<br>OR<br>• B. **Leptotene-** Chromosomes start condensing<br>• **Zygotene-** Pairing of homologous chromosomes. Synapsis is characterized by the formation of the synaptonemal complex. Chromosomes appear as bivalent or tetrad<br>• **Pachytene-** Crossing over takes place between non-sister chromatids and recombination nodule is formed. It is an enzyme-mediated process. The enzyme responsible for crossing over is **Recombinase**<br>• **Diplotene-** Synaptonemal complex dissolve and homologous chromosomes separate from each other, except at the crossovers forming **Chiasmata** (the 'X' shaped structure). Oocyte of some vertebrates can remain at the diplotene stage for years, e.g. human **primary oocytes** remain in this stage until puberty when ovulation occurs**Lampbrush chromosomes** found in the oocyte of amphibians are formed at the diplotene stage. | 5 |

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| | • **Diakinesis-** Nucleolus disappears, chiasmata separate and nuclear envelope also starts degenerating. | |