QB365 Question Paper Software
11th Standard - Biology
Cell Cycle and Cell Division Assertion and reason

Exam Time: 00:20 Hrs | Date: 2025-10-10

Total Marks: 10

Questions:

Assertion and reason

1. **Assertion :** Every chromosome, during metaphase has two chromatids.
Reason : Synthesis of DNA takes places in the S-phase of interphase.
Codes:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

2. **Assertion:** Interkinesis is a stage between two meiotic divisions.
Reason: Interkinesis is generally short lived.
Codes:
A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
C. Assertion is correct but the reason is wrong.
D. Both Assertion and Reason are false.

3. **Assertion:** Synthesis of DNA takes place in the S- phase of interphase.
Reason: Every chromosome, during metaphase, has two chromatids.
Codes:
A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
C. Assertion is correct but the reason is wrong.
D. Both Assertion and Reason are false.

4. **Assertion:** The characteristic phenomenon during pachytene is the recombination of genes.
Reason: Crossing over results in the formation of chiasmata.
Codes:
A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
C. Assertion is correct but the reason is wrong.
D. Both Assertion and Reason are false.

5. **Assertion:** The colchicine treated meristematic cells show doubling of chromosomes.
Reason: Colchicine does not inhibit chromosome replication.
Codes:
A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
C. Assertion is correct but the reason is wrong.
D. Both Assertion and Reason are false.

6. **Assertion:** In animal cells, the poles are formed by the asters.
Reason: They are called amphiaster, since wo asters are present at the spindle of animal cells.
Codes:
A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
C. Assertion is correct but the reason is wrong.
D. Both Assertion and Reason are false.

7. **Assertion:** During anaphase, centromere of each chromosomes splits and chromatids separate.
Reason : Chromatids move to opposite poles.
Codes:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

8. **Assertion :** Diplotene is characterized by the presence of chiasmata.
Reason : Diplotene can last for months and years in oocytes of some vertebrates. [AIIMS 2016]
Codes:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

9. **Assertion :** During zygotene, chromosomes show bivalent stage.
Reason : Bivalent is half the number of chromosomes.
Codes:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

10. **Assertion:** Crossing over leads to recombination of genetic material on the two chromosomes.
Reason : It is the exchange of genetic material between two homologous chromosomes.
Codes:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

Answers Key:

Assertion and reason

1. (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
Explanation:
In S phase or synthetic phase chromosomes replicates, DNA content doubles, i.e., 1C to 2C for haploid cells and 2C to 4C for diploid cells. Along with replication of DNA, new chromatin fibres are formed which remain attached in pairs and the number of chromosomes does not increase i.e. 1n to 1n and 2n to 2n. As the chromatin fibres are elongated chromosomes, each chromosomes comes to have two chromatin threads which are attached at centromere. During metaphase, every chromosome have two chromatids. The chromosomes separate from each other during anaphase.
2. B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
3. A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
4. B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
5. A. Assertion and reason both are correct and reason is the correct explanation of Assertion.
6. B. Assertion and reason both are correct and reason is not the correct explanation of Assertion.
7. (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
Explanation:
In anaphase, centromeres of chromosomes start to divide into two, forming daughter chromatids with centromere in each. Daughter chromosomes are repulsive so, migrate towards opposite poles. Spindle fibres attached to the centromeres shorten and pull the chromosomes, the centromeres lead the path while the limbs trail behind. So, anaphasic chromosomes appear as V, L, J and L shaped.
8. (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
Explanation:
Diplotene is the longest and most active subphase of prophase I of meiosis. The beginning of diplotene is recognized by the dissolution of synaptonemal complex and the

tendency of the recombined homologous chromosomes of the bivalents to separate from each other except at the sites of crossovers. These X-shaped structures are called chiasmata. Diplotene can last for months and years in oocytes of some vertebrate.

9. (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

   Explanation:

   During zygotene, because of the pairing of the homologues, the nucleus contains half the number of chromosomes. Each unit is a bivalent composed of two homologous chromosomes.

10. (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

    Explanation:

    Crossing over occurs during pachytene. Recombination involves mutual exchange of the corresponding segments of non- sister ch romatids of homologous chromosomes. It takes place by breakage
    and reunion of chromatid segments. Breakage, called nicking, is assisted by an enzyme endonuclease and reunion termed annealing, is aided by an enzyme ligase. Crossing over leads to recombination of genetic material on the two chromosomes.