QB365 Question Paper Software
12th Standard - Biology
Biotechnology: Principles and Processes Assertion and reason

Exam Time: 00:20 Hrs | Date: 2025-09-29

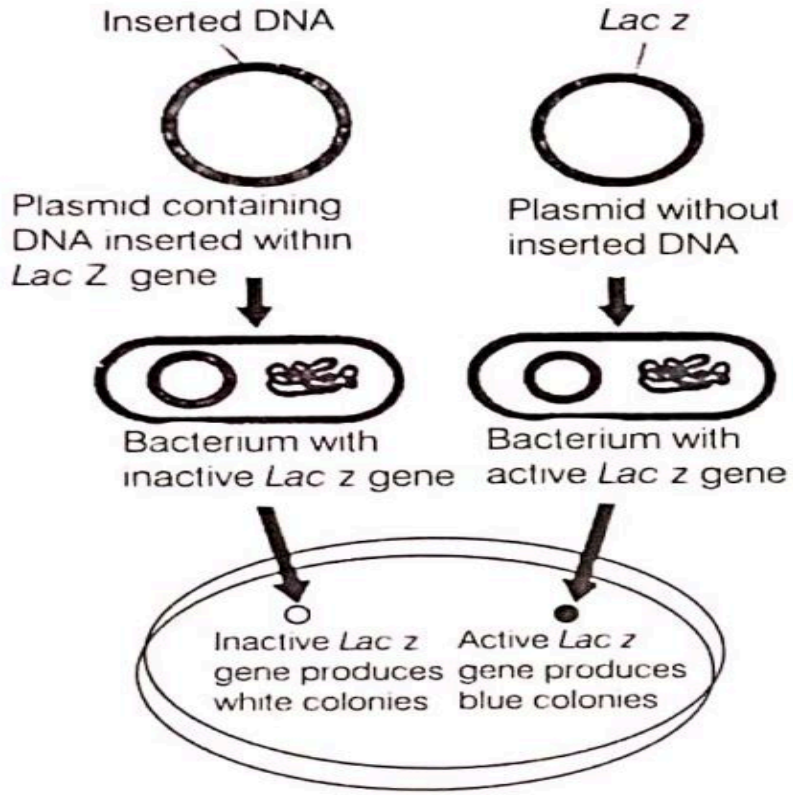
Total Marks: 10

Questions:

1. **Assertion:** Vector DNA and foreign DNA are cut by same restriction endonuclease.
   Reason: Digestion of vector DNA and foreign DNA with same enzyme produces complementary sticky ends
   Codes:
   (a) Both assertion and reason are true and reason is the correct explanation of assertion.
   (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
   (c) Assertion is true but reason is false.
   (d) Both assertion and reason are false.

2. **Assertion (A)** Biotechnology deals with techniques that use living organism to produce products useful for humans.
   Reason (R) It uses only a unicellular organism.
   (a) If both A and R are true and R is the correct explanation of A
   (b) If both A and R are true, but R is not the correct explanation of A
   (c) If A is true, but R is false
   (d) If A is false, but R is true

3. Figure given below representing the insertional inactivation of lac z gene. Study the figure and comment upon the appropriateness of the Assertion and Reason.



Assertion (A) Present of insert in the above figure results in inactivation of enzyme β-

galactosidase.

Reason (R) Insertion of recombinant DNA within the coding sequence of β-galactosidase results in colourless colonies.

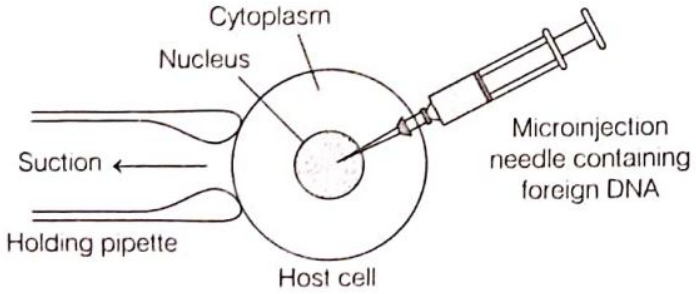
(a) If both A and R are true and R is the correct explanation of A

(b) If both A and R are true, but R is not the correct explanation of A

(c) If A is true, but R is false

(d) If A is false, but R is true

4. Given below is the figure of a method of gene transfer. Study the figure and comment upon the appropriatness of the Assertion and Reason.



Assertion (A) The foreign DNA is injected directly into the nucleus.

Reason (R) This pipette can puncture the plasma membrane.

(a) If both A and R are true and R is the correct explanation of A

(b) If both A and R are true, but R is not the correct explanation of A

(c) If A is true, but R is false

(d) If A is false, but R is true

5. **Assertion :** Enzyme application in industry is enhanced by its immobilization.

Reason : Immobilization provides protection to enzymes without affecting their activity.

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.

6. **Assertion (A):** The advantage of plasmids is that it is easy to isolate and reintroduce them into suitable host.

Reason (R): All plasmids used as cloning vectors are obtained from bacteria only.

Codes:

a)Both (A) and (R) are true and (R) is the correct explanation of (A)

b)Both (A) and (R) are true and (R)is not the correct explanation of (A)

c)(A) is true but (R) is false

d)Both (A) and (R) are false

7. **Assertion(A) :** Cosmid is a hybrid vector.

Reason(R) : It is formed by the modification of plasmid DNA with the help of a specifc segment from lambda phage DNA.

Codes:

a)Both (A) and (R) are true and (R) is the correct explanation of (A)

b)Both (A) and (R) are true and (R)is not the correct explanation of (A)

c)(A) is true but (R) is false

d)Both (A) and (R) are false

8. **Assertion(A) :** Production of multiple copies of a desired DNA in an “in vitro" process by constructingr-DNA and introducing it into a bacterium is called gene cloning.
   Reason(R) : The in vitro amplification of DNA by repeated cyclesofDNA strands separation and polymerisation is called polymerase chain reaction.
   Codes:
   a)Both (A) and (R) are true and (R) is the correct explanation of (A)
   b)Both (A) and (R) are true and (R)is not the correct explanation of (A)
   c)(A) is true but (R) is false
   d)Both (A) and (R) are false

9. **Assertion (A) :** Biolistic method is a direct way to be used to introduce alien gene into the host cell.
   Reason (R): In biolistic method of gene transfer, high velocity microparticles of gold or tungsten, coated with DNA are bom- barded on the plant cells
   Codes:
   a)Both (A) and (R) are true and (R) is the correct explanation of (A)
   b)Both (A) and (R) are true and (R)is not the correct explanation of (A)
   c)(A) is true but (R) is false
   d)Both (A) and (R) are false

10. **Assertion(A):** In recombinant DNA technology, human genes are often transferred into bacteria (prokaryotes) or yeast (eukaryote).
    Reason(R): Both bacteria and yeast multiply very fast to form huge population, which express the desired gene.
    Codes:
    a)Both (A) and (R) are true and (R) is the correct explanation of (A)
    b)Both (A) and (R) are true and (R)is not the correct explanation of (A)
    c)(A) is true but (R) is false
    d)Both (A) and (R) are false

Answers Key:

1. (a) Both assertion and reason are true and reason is the correct explanation of assertion.
2. (c) If A is true, but R is false
3. (b) If both A and R are true, but R is not the correct explanation of A
4. (b) If both A and R are true, but R is not the correct explanation of A
5. (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
   Explanation:
   An immobilized enzymes is physically entrapped or covalently bonded by chemical means to an inert and usually insoluble matrix, where it can act upon its natural substrate. The matrix is usually a high molecular weight polymer such as polyacrylamide, cellulose, starch, glass, beads, etc. Because of its binding with a matrix the immobilized enzyme has better stability in many cases. Efficiency of immobilized enzyme is better. The enzyme can be recovered at the end of the reaction and can be used repeatedly.
6. c)(A) is true but (R) is false
7. a)Both (A) and (R) are true and (R) is the correct explanation of (A)
8. b)Both (A) and (R) are true and (R)is not the correct explanation of (A)
9. a)Both (A) and (R) are true and (R) is the correct explanation of (A)
10. a)Both (A) and (R) are true and (R) is the correct explanation of (A)