

Biotechnology - Principles and Processes & Biotechnology and its Applications

- Assertion (A):** Green revolution succeeded in tripling the food supply.
Reason (R): It is mainly due to the use of better management practices and use of agrochemicals.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
- Assertion (A):** GM technique has been used to create tailor made plants to supply alternative resources to industries.
Reason (R): Plants, bacteria, fungi & animals whose genes have been altered by manipulation are called GMO.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
- Assertion (A):** *Bacillus thuringiensis* produces protein that kills lepidopteran insect only.
Reason (R): It forms active protein crystals during a particular phase of their growth.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
- Assertion (A):** Crystal protein does not kill the *Bacillus* & kill only insect.
Reason (R): In *Bacillus* it exists as inactive proteins but in insect it is converted into an active form due to acidic pH of the gut.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
- Assertion (A):** The activated toxin binds to the surface of midgut epithelial cells & create pores that cause cell swelling & lysis & finally death of insect.
Reason (R): Most of Bt toxins are insect group specific.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
- Assertion (A):** The choice of cry-gene depends upon the crop & the targeted pest.
Reason (R): Gene cry IAc & cry II Ab control the cotton bollworms while cry IAb controls corn borer.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
- Assertion (A):** RNAi involves silencing of a specific mRNA due to complementary RNA that binds to & prevents translation of the mRNA.
Reason (R): RNAi takes place in all prokaryotic organisms as a method of cellular defense.

 - (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false



8. Assertion (A): The nematode parasite could not survive in a transgenic plant expressing specific interfering RNA.

Reason (R): The sense & anti-sense RNA in host are complementary & forms a dsRNA, thus silenced the specific m RNA of nematod.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

9. Assertion (A): The recombinant therapeutics do not induce unwanted immunological response.

Reason (R): About 30 recombinant therapeutics have been approved for human use world-wide.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

10. Assertion (A): The proinsulin contains an extra stretch called as C-peptide.

Reason (R): Insulin consists of two short polypeptide chans A & B that are linked together by disulphide bridges.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

11. Assertion (A): The main challenge for production of insulin using r-DNA technique was getting insulin assembled into a mature form.

Reason (R): The C-peptide is not present in mature insulin & is removed during maturation process.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

12. Assertion (A): Eli Lilly prepared two DNA sequences of A & B chains of insulin & introduced them in the plasmids of one E.coli.

Reason (R): Chains A & B produced by this E. coli is extracted & combined by creating disulfide bonds to form insulin

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

13. Assertion (A): Gene therapy is a collection of methods that allows correction of a gene defect diagnosed in a child or embryo.

Reason (R): It involves delivery of normal gene into the individual or embryo to take over the function of the non functional gene.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

14. Assertion (A): ADA deficiency can not be cured permanently by gene therapy.

Reason (R): The genetically engineered lymphocytes are immortal only in culture conditions.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



15. **Assertion (A):** In gene therapy of SCID, a patient requires periodic infusion of genetically engineered lymphocytes.

Reason (R): If the ADA gene is introduced into cells at early embryonic stage, it could be a permanent cure.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

16. **Assertion (A):** For effective treatment of a disease, early diagnosis & understanding its pathophysiology is very important.

Reason (R): r-DNA technique, PCR & ELISA serve the purpose of early diagnosis.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

17. **Assertion (A):** ELISA is based on the principle of antigen antibody interaction.

Reason (R): Infection by pathogen can be detected by the presence of antigens or by detecting antibodies synthesized against the pathogen.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

18. **Assertion (A):** Inserting alien DNA in pBR322 plasmid at Pst I makes the transformants sensitive to ampicillin antibiotic.

Reason (R): Restriction site for Pst I is present on amp^R.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

19. **Assertion (A):** DNA ligase plays important role in recombinant DNA technology.

Reason (R): The linking of antibiotic resistant gene with plasmid vector became possible by enzyme DNA ligase.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

20. **Assertion (A):** Restriction enzymes belong to a larger class of enzymes called nucleases.

Reason (R): Each restriction enzyme recognizes a specific palindromic nucleotide sequence in the DNA

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

21. **Assertion (A):** RNA interference takes place in all eukaryotic organisms as a method of cellular defense.

Reason (R): This method involves ds RNA which prevent transcriptional process.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

22. **Assertion (A):** An alien DNA is linked with the origin of replication for making multiple identical copies.

Reason (R): An origin of replication is a specific DNA sequence which is responsible for initiating replication.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



Directions: In the following questions, a statement of assertion is followed by a statement of reason. Mark the correct choice as:

- (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.

23. **Assertion:** Streptococcus pneumoniae and Haemophilus influenzae are responsible for causing infectious diseases in human beings.

Reason: A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person.

24. **Assertion:** Plasmodium vivax is responsible for malaria.

Reason: Malaria is caused by polluted water.

25. **Assertion :** Rabies is an infection of mammals, it involves central nervous system which may result in paralysis and finally death.

Reason : This is caused by neurotropic bacteria in saliva of rabies animal.

26. **Assertion:** Myasthenia gravis is an autoimmune disease.

Reason : Immune system rejects the transplant muscles.

27. **Assertion:** Histamine is related with allergic and inflammatory reactions.

Reason: Histamine is a vasodilator.

28. **Assertion :** Organ transplantation patients are given immunosuppressive drugs.

Reason : Transplanted tissue has antigens which stimulate the specific immune response of the recipient.

29. **Assertion :** A person who has received a cut and is bleeding needs to be given anti-tetanus treatment.

Reason : Anti-tetanus injection provides immunity by producing antibodies for tetanus.

30. **Assertion:** AIDS is a disorder caused by HIV.

Reason: HIV is a virus that damages the immune system of its host.

31. **Assertion:** HIV infected person are prone to opportunistic diseases.

Reason: Immune system weakens during HIV infection.

32. **Assertion:** Alcohol along with other stimulants or narcotic drugs is extremely harmful.

Reason: Alcohol damages digestive system only.

33. **Assertion :** There is addiction in case of stimulants.

Reason : Withdrawal symptoms are psychological.

34. **Assertion :** Severe Acute Respiratory syndromes is common in China.

Reason: China is the most populated country of the world.

35. **Assertion:** β -cells work chiefly by secreting substances called antibodies into the body fluids.

Reason: Antibodies ambush foreign antigen circulating in the blood stream.

36. **Assertion:** Interferons help in the elimination of viral infections.

Reason : Interferons released by infected cells, reach nearby unaffected cells and make them resistant to viral infection.



ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	1	2	4	3	2	2	3	1	2	2	1	4	1	4	2	2	1	1	1	2
Que.	21	22																		
Ans.	3	1																		

23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.			
B	B	C	C	A	A	C	A	A	C	B	B	A	a			