DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : BIOLOGY
DPP No. : 9

Topic :- Biotechnology & It's Applications

1 **(a)**
The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as insecticide

2 **(d)**
DNA fingerprinting is a technique to identify a person on the basis of persons DNA specificity. The technique was developed by **Sir Alec Jeffreys** (1964) at Leicester University, UK.

3 **(a)**
Specific *Bt* toxin genes obtained from bacteria *Bacillus thuringiensis* are used in several crop plants. The toxin is coded by a gene called *cry*, which is of various types. For example, proteins encoded by the genes *cry* I Ac and *cry* II Ab controls the cotton bollworms and that of *cry* I Ab controls corn borer. *Bt* toxin are initially inactive protoxins but after ingestion by the insects their inactive toxins become active due to the alkaline pH of the gut, which solublise the crystals

4 **(c)**
Silencing of a gene could be achieved through the use of RNAi and antisense RNA

5 **(a)**
In callus culture, shoot and root regenerations are controlled, generally, by auxin-cytokinin balance. Usually, the excess of auxin (such as naphthalene acetic acid or NAA), promotes root regeneration, whereas that of cytokinin (like BAP) promotes shoot regeneration.

6 **(d)**
Golden rice is developed of Swiss Federal Institute of Technology. The rice grains are golden yellow in colour due to the presence of β-carotene. It

contains 'beta carotene' gene from daffodil plants and also genes from some bacteria. Golden rice will prevents child blindness caused due to deficiency of vitamin-A

7 **(c)**

Genetic Engineering Approval Committee – Government of India formed the organisation like GEAC (Genetic Engineering Approval Committee) to decides the validity and safety of GM organisms for public safety

8 **(a)**

DNA ligase is used to seal the nicks that remain in recombinant DNA molecule. In fact DNA ligase joins together the neighbouring nucleotides flanking a discontinuity in a DNA strand by forming a phosphodiester bond.

9 **(d)**

Genetic modification of crops have resulted in
(i) Increased tolerance against abiotic stresses (cold, drought, salt and heat)
(ii) Reduced reliance on chemical pesticides (pest-resistant crops)
(iii) Reduced post-harvest losses
(iv) Enhanced nutritional value of food, *e.g.*, vitamin-A enriched (golden rice)
(v) Increased efficiency of minerals used by the plants (this prevents early exhaustion of fertility of soil)

10 **(a)**

Insect resistant transgenic plants contain either a gene from the bacterium *Bacillus thuringiensis* or some other gene. In Bt cotton and Bt tobacco the insect resistant gene is transferred from *Bacillus thuringiensis*.

11 **(b)**

Transgenic golden rice was created by transforming rice with the genes *Psy* (phytoene synthase) from daffodil (*Narcissus pseudonarcissus*) and *Cry* 1 from the soil bacterium *Erwinia uredovora*.

12 **(b)**

Plasmids are used in genetic engineering.

13 **(d)**
An explant is the excised piece of tissue or organ used for culture. An explant before organogenesis is heterotrophic which grows on a synthetic medium and sucrose is the most commonly used carbon source.

14 **(b)**
A nematode *Meloidegyne incognitia* infects the roots of tobacco plants, which reduces the production of tobacco. It can be prevented by using RNA interference (RNAi) process, which is checked by the silencing of specific *m*RNA due to a complementary *ds*RNA. *ds*RNA binds and prevents the translation of the *m*RNA (silencing)

15 **(a)**
The restriction endonuclease *Eco* RI is obtained from *Escherichia coli* Ry 13. The recognition sequence for this is G/AATTC, CTTAA/G.

16 **(d)**
Transgenic tobacco plants containing a gene (*cry*) from a bacterium, *Bacillus thuringiensis* have been produced.
This bacterial gene specifies an insecticidal protein that destroys the stomach lining of the insects and kills them. The tobacco plants with this gene produces their own insecticide

17 **(a)**
Gene for human alpha lactalbumin was introduced into the genes of first transgenic cow, which made the milk nutritionally richer

18 **(a)**
Bacillus thuringiensis was the first to be used as biopesticides on the commercial scale in the world

19 **(c)**
Silk is obtained from cocoon (pupa) of silk moth. The salivary glands are modified and forming silk glands of larva. Silk is secreted by silk glands.

20 **(c)**

Bacillus anthracis (anthrax) and *B. mallei* (glanders, the most common biological weapon) were used in WW-I by Germany, to infect livestock and animal feed exported to Allies.

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**A**	**D**	**A**	**C**	**A**	**D**	**C**	**A**	**D**	**A**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**B**	**B**	**D**	**B**	**A**	**D**	**A**	**A**	**C**	**C**