CHAPTER 6

Biotechnology and It's Application

Biotechnological Application in Agriculture

1. Transposons can be used during which one of the following? *(2022)*

a. Gene sequencing
b. Polymerase Chain Reaction
c. Gene silencing
d. Autoradiography

2. Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (Bt) is resistant to *(2020)*

a. Fungal diseases
b. Plant nematodes
c. Insect predators
d. Insect pests

3. RNA interference is used for which of the following purposes in the field of biotechnology? *(2020-Covid)*

a. To develop a pest resistant plant against infestation by nematode
b. To enhance the mineral usage by the plant
c. To reduce post harvest losses
d. To develop a plant tolerant to abiotic stresses

4. Which of the following is true for Golden rice? *(2019)*

a. It is Vitamin A enriched, with a gene from *daffodil*
b. It is pest resistant, with a gene from *Bacillus thuringiensis*
c. It is drought tolerant, developed using *Agrobacterium* vector
d. It has yellow grains, because of a gene introduced from a primitive variety of rice

5. What triggers activation of protoxin to active Bt toxin of *Bacillus thuringiensis* in boll worm? *(2019)*

a. Body temperature
b. Moist surface of midgut
c. Alkaline pH of gut
d. Acidic pH of stomach

6. Which part of the tobacco plant is infected by *Meloidogyne incognita*? *(2016 - I)*

a. Flower
b. Leaf
c. Stem
d. Root

7. In Bt cotton, the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to: *(2015)*

a. Action of gut micro-organism
b. Presence of conversion factors in insect gut
c. Alkaline pH of the insect gut
d. Acidic pH of the insect gut

8. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of: *(2015 Re)*

a. Vitamin C
b. Omega 3
c. Vitamin A
d. Vitamin B

9. Which of the following Bt crops is being grown in India by the farmers? *(2013)*

a. Soyabean
b. Maize
c. Cotton
d. Brinjal

Biotechnological Application in Medicine

10. In gene therapy of Adenosine Deaminase (ADA) deficiency, the patient requires periodic infusion genetically engineered lymphocytes because: *(2022)*

a. Genetically engineered lymphocytes are not immortal cells.
b. Retroviral vector is introduced into these lymphocytes.
c. Gene isolated from marrow cells producing ADA is introduced into cells at embryonic stages
d. Lymphocytes from patient's blood are grown in culture, outside the body.

11. Statements related to human Insulin are given below. Which statement(s) is/are correct about genetically engineered Insulin? *(2022)*

A. Pro-hormone insulin contain extra stretch of C-peptide
B. A-peptide and B-peptide chains of insulin were produced separately in *E.coli*, extracted and combined by creating disulphide bond between them.
C. Insulin used for treating Diabetes was extracted from Cattles and Pigs.
D. Pro-hormone Insulin needs to be processed for converting into a mature and functional hormone.
E. Some patients develop allergic reactions to the foreign insulin.

Choose the most appropriate answer from the options given below.

a. C, D and E only
b. A, B and D only
c. B only
d. C and D only

12. When gene targetting involving gene amplification is attempted in an individual's tissue to treat disease, it is known as: *(2021)*

a. Gene therapy b. Molecular diagnosis
c. Safety testing d. Biopiracy

13. Which of the following is not an application of PCR (Polymerase Chain Reaction) ? *(2021)*

a. Gene amplification b. Purification of isolated protein
c. Detection of gene mutation d. Molecular diagnosis

14. Which of the following is a correct sequence of steps in a PCR (Polymerase Chain Reaction)? *(2021)*

a. Denaturation, Extension, Annealing
b. Extension, Denaturation, Annealing
c. Annealing, Denaturation, Extension
d. Denaturation, Annealing, Extension

15. Now a days it is possible to detect the mutated gene causing cancer by allowing radioactive probe to hybridise its complimentary DNA in a clone of cells, followed by its detection using autoradiography because: *(2021)*

a. Mutated gene completely and clearly appears on a photographic film.
b. Mutated gene does not appear on a photographic film as the prober has no complimentarity with it.
c. Mutated gene does not appear on photographic film as the probe has complimentarity with it.
d. Mutated gene partially appears on a photographic film.

16. With regard to insulin choose correct options. *(2021)*

A. C-peptide is not present in mature insulin.
B. The insulin produced by rDNA technology has C-peptide.
C. The pro-insulin has C-peptide.
D. A-peptide and B-peptide of insulin are interconnected by disulphide bridges.

Choose the correct answer from the options given below.

a. B and C only b. A, C and D only
c. A and D only d. B and D only

17. For effective treatment of the disease, early diagnosis and understanding its pathophysiology is very important. Which of the following molecular diagnostic techniques is very useful for early detection? *(2021)*

a. Southern Blotting Technique
b. ELISA Technique
c. Hybridization Technique
d. Western Blotting Technique

18. The adenosine deaminase deficiency results into: *(2021)*

a. Parkinson's disease
b. Digestive disorder
c. Addison's disease
d. Dysfunction of Immune system

19. Which of the following statements is not correct? *(2020)*

a. The proinsulin has an extra peptide called C-peptide
b. The functional insulin has A and B chains linked together by hydrogen bonds
c. Genetically engineered insulin is produced in *E.coli*.
d. In man insulin is synthesised as a proinsulin.

20. Match the following columns and select the correct option *(2020)*

	Column-I		Column-II
1.	Bt cotton	(i)	Gene therapy
2.	Adenosine deaminase deficiency	(ii)	Cellular defence
3.	RNAi	(iii)	Detection of HIV infection
4.	PCR	(iv)	*Bacillus thuringiensis*

	(1)	(2)	(3)	(4)
a.	(iii)	(ii)	(i)	(iv)
b.	(ii)	(iii)	(iv)	(i)
c.	(i)	(ii)	(iii)	(iv)
d.	(iv)	(i)	(ii)	(iii)

21. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes? *(2018)*

a. Retrovirus b. Ti plasmid
c. λ phage d. pBR322

22. Which kind of therapy was given in *1990* to a four year old girl with adenosine deaminase (ADA) deficiency? *(2016 - II)*

a. Immunotherapy b. Radiation therapy
c. Gene therapy d. Chemotherapy

23. The two polypeptides of human insulin are linked together by: *(2016 - I)*

a. Hydrogen bonds b. Phosphodiester bond
c. Covalent bond d. Disulphide bridges

24. ADA is an enzyme which is deficient in a genetic disorder SCID. What is the full form of ADA? *(2014)*

a. Adenosine DeoxyAminase b. Adenosine Deaminase
c. Aspartate Deaminase d. Arginine Deaminase

25. The first human hormone produced by recombinant DNA technology is: *(2014)*

a. Progesterone b. Insulin
c. Estrogen d. Thyroxin

Ethical Issues

26. The laws and rules to prevent unauthorised exploitation of bio-resources are termed as- *(2020-Covid)*

a. Bioethics b. Bioengineering
c. Biopiracy d. Biopatenting

27. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is: *(2018)*

a. Indian Council of Medical Research (ICMR)
b. Council for Scientific and Industrial Research (CSIR)
c. Research Committee on Genetic Manipulation (RCGM)
d. Genetic Engineering Appraisal Committee (GEAC)

28. A 'new' variety of rice was patented by a foreign company though such varieties have been present in India for a long time. This is related to: *(2018)*

a. Co-667 b. Sharbati Sonora
c. Lerma Rojo d. Basmati

29. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called: *(2018)*

a. Bio-infringement
b. Biopiracy
c. Biodegradation
d. Bioexploitation

30. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services? *(2015)*

a. Genetic Engineering Approval Committee
b. Research Committee on Genetic Manipulation
c. Bio-safety committee
d. Indian Council of Agricultural Research

Answer Key

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
c	d	a	a	c	d	c	c	c	a	c	a	b	d	b	b	b
18	19	20	21	22	23	24	25	26	27	28	29	30				
d	b	d	a	c	d	b	b	d	d	d	b	a				