

BIOTECHNOLOGY AND ITS APPLICATION

1. A transgenic food crop, which may help in solving the problem of night blindness in developing countries is :
 - (1) Bt soyabean
 - (2) Golden rice
 - (3) Flavr savr tomatoes
 - (4) Starlink maize
2. Bacterium *Bacillus thuringiensis* is widely used in contemporary biology as
 - (1) Source of industrial enzyme
 - (2) Indicator of water pollution
 - (3) Insecticide
 - (4) Agent for production of dairy products.
3. Bt toxin is produced by *Bacillus thuringiensis* which is :
 - (1) Bacterium
 - (2) Protozoa
 - (3) Fungus
 - (4) Virus
4. GEAC stands for :
 - (1) Gene evaluation approval committee
 - (2) Genetic engineering approval committee
 - (3) Genetic engineering applied committee
 - (4) Gene enhancement approval committee
5. Conventional methods to diagnose a disease are :
 - (1) Serum and urine analysis
 - (2) PCR
 - (3) ELISA
 - (4) All of the above
6. The first transgenic cow, which produced human protein enriched milk was named :
 - (1) Andy
 - (2) Dolly
 - (3) Rosie
 - (4) Dumpy
7. Milk of transgenic cow 'Rosie' contains a substance that was nutritionally more balanced product for human babies is :
 - (1) α -lactalbumin
 - (2) β -lactalbumin
 - (3) γ -lactalbumin
 - (4) δ -lactalbumin
8. Which peptide is not present in the mature insulin and is removed during maturation into insulin?
 - (1) A-peptide
 - (2) B-peptide
 - (3) C-peptide
 - (4) Both (1) and (2)
9. Two polypeptide chains of insulin are linked together by :
 - (1) disulphide bonds
 - (2) hydrogen bonds
 - (3) Phosphodiester bonds
 - (4) Glycosidic bonds
10. 'Flavr Savr' is a transgenic variety of :
 - (1) Potato
 - (2) Tomato
 - (3) Soyabean
 - (4) Rice
11. Golden rice is enriched in :
 - (1) Vitamin C
 - (2) Vitamin D
 - (3) Vitamin A
 - (4) Vitamin E
12. For the control of the cotton bollworms, which one of the genes is useful ?
 - (1) Cry 1 Ac
 - (2) Cry 1 Ab
 - (3) Cry 1 Ad
 - (4) All of these
13. Process involving silencing of a specific mRNA due to a complementary dsRNA molecule is called :
 - (1) Transcription
 - (2) RNA interference
 - (3) DNA interference
 - (4) None of these
14. *Meloidogyne incognitia* which infects the roots of tobacco plants causing a great reduction in yield is a :
 - (1) Nematode
 - (2) Bacterium
 - (3) Virus
 - (4) Alga
15. Toxin present in *Bacillus thuringiensis* does not kill the bacterium because it is inactive form what makes it active inside the insect ?
 - (1) the alkaline pH of the gut, which solubilises the crystals
 - (2) the acid pH of the gut
 - (3) the neutral pH of the gut
 - (4) All of the above

16. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because :
- (1) bacteria are resistant to the toxin
 - (2) toxin is immature
 - (3) toxin is inactive
 - (4) bacteria enclose toxin in a special sac
17. Which one of the following statements about genetically engineered insulin is incorrect.
- (1) *E. coli* is used for producing humulin
 - (2) Chains A, B were produced separately
 - (3) Eli Lilly company prepared it for first time
 - (4) Genetically engineered insulin has C-peptide
18. Infection by pathogen can be detected by the presence of antigens or by detecting the antibodies synthesised against the pathogen, on this principle a test is based which is ?
- (1) PCR
 - (2) ELISA
 - (3) Both (1) and (2)
 - (4) None of the above
19. Indian parliament recently cleared, which amendment of the Indian patents bill,
- (1) First amendment (2) Second amendment
 - (3) Third amendment (4) Fourth amendment
20. How many documented varieties of basmati rice distinct for its unique aroma and flavour are grown in India?
- (1) 27 varieties (2) 25 varieties
 - (3) 28 varieties (4) 26 varieties
21. Over 95 percent of all existing transgenic animals are :
- (1) Pigs (2) Cows
 - (3) Fish (4) Mice
22. The organisation set up for making decisions regarding the validity of GM research and the safety of introducing GM organism for public services is :
- (1) Genetic engineering approval committee
 - (2) Genetic engineering advanced company
 - (3) Genetic engineering applied committee
 - (4) None of these
23. Use of bio-resources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment is called :
- (1) Biotheft
 - (2) Biopatent
 - (3) Biopiracy
 - (4) None of the above
24. Which of the following plants is genetically modified for improved nutritional value of food?
- (1) Potato (2) Wheat
 - (3) Rice (4) Maize
25. Which animal is being used to test the safety of polio vaccine?
- (1) Transgenic mice
 - (2) Transgenic pig
 - (3) Transgenic cow
 - (4) Transgenic cat
26. Cry1 Ab gene produces proteins which control?
- (1) Bollworms
 - (2) Corn borer
 - (3) Both (1) and (2)
 - (4) None of the above
27. Nematode-specific genes were introduced into the host plant (tobacco plant) by using which vector?
- (1) Plasmid vector
 - (2) Cosmid vector
 - (3) Bacteriophage vector
 - (4) BAC
28. Which one of the following statements are true regarding genetic modifications ?
- (1) Genetic modifications reduced reliance on chemical pesticides
 - (2) Genetic modifications has enhanced nutritional value of food.
 - (3) Genetic modifications made crops more tolerant to abiotic stresses.
 - (4) All are correct

- 29.** Critical research areas of biotechnology are :
- (1) providing the best catalyst in the form of improved organism usually a microbe or pure enzyme.
 - (2) Creating optimal conditions through engineering for a catalyst to act.
 - (3) Down stream processing technologies to purify the protein/organic compound.
 - (4) All the above
- 30.** Bacterium genetically engineered for cleaning oil spills is :
- (1) *Eischerichia coli*
 - (2) *Pseudomonas putida*
 - (3) *Salmonella typhimurium*
 - (4) *Agrobacterium tumifaciens*
- 31.** Bacterium which is known as 'Super bug' is :
- (1) *Pseudomonas putida*
 - (2) *Salmonella*
 - (3) *Eischerichia*
 - (4) *Agrobacterium*
- 32.** Animals those have had their DNA manipulated to possess and express an extra (foreign) gene are known as :
- (1) Transgenic animals
 - (2) Genetically modified animals
 - (3) Both (1) and (2)
 - (4) None of the above
- 33.** When cut by the restriction enzyme, the DNA fragments can be joined together using :
- (1) DNA polymerase (2) DNA ligase
 - (3) Alkaline phosphatase (4) DNA gyrase
- 34.** Genetically engineered human insulin is made in
- (1) Fungus (2) Protista
 - (3) Plants (4) Bacterium
- 35.** Genetically engineered bacteria are being used in commercial production of :
- (1) melatonin (2) testosterone
 - (3) thyroxine (4) human insulin
- 36.** Insulin consists of two short polypeptide chains, which are linked together by?
- (1) Sulphide bridges (2) Peptide bridges
 - (3) Chloride bridges (4) Disulphide bridges
- 37.** *Meloidegyne incognitia* infects the root of which plant ?
- (1) Potato (2) Soyabean
 - (3) Tobacco (4) Tomato
- 38.** Genetics modified crops (GMC) are useful in agriculture because :
- (1) They are more tolerant to abiotic stresses
 - (2) They increase reliance on chemical pesticide
 - (3) They have reduced nutritional value
 - (4) All the above
- 39.** The protien encoded by the gene cryIAc and cryIIAb, controls :
- (1) Cotton bollworm (2) Corn borer
 - (3) Cotton borer (4) All the above
- 40.** A nematode *Meloidegyne incognitia* infects the root of tobacco plant and causes a great reduction in yield. A novel strategy was adopted to prevent this infection which was based on the process of :
- (1) DNA interference
 - (2) RNA interference
 - (3) PCR technique
 - (4) DNA test
- 41.** In RNA interference (RNAi) :
- (1) The silencing of a specific mRNA due to a complementary dsRNA molecule that binds to and prevent translation of the mRNA :
 - (2) The silencing of a specific mRNA due to dsDNA
 - (3) The silencing of a specific mRNA due to tRNA
 - (4) All the above
- 42.** Transgenic animals produces biological product such as α -1-antitrypsin, which is used to treat :
- (1) Emphysema
 - (2) Cystic fibrosis
 - (3) Phenyl ketonuria
 - (4) Sickle cell anaemia

43. The first transgenic cow was 'Rosie', produces :
- (1) Human protein-enriched milk (α -lactalbumin)
 - (2) Human protein α -1 antitrypsin riched milk
 - (3) Human protein enriched milk (insulin)
 - (4) All the above
44. Transgenic mice are being developed for use in :
- (1) Testing the safety of polio vaccines before they are used on human
 - (2) Molecular diagnosis of diseases
 - (3) Production of human protein enriched milk
 - (4) Production of human insulin
45. The technique that serves the purpose of early diagnosis of disease or pathogen :
- (1) Recombinant DNA technology
 - (2) Polymerase chain reaction (PCR)
 - (3) Enzyme linked immuno sorbent assay (ELISA)
 - (4) All the above
46. Transgenic tobacco which is developed through RNA interference, prevents the infection of :
- (1) A nematode - *Meloidogyne incognitia*
 - (2) A bacterium - *Pseudomonas putida*
 - (3) A fungi - *Trichoderma*
 - (4) An insect
47. The first clinical gene therapy was given to a 4-year old girl with ADA deficiency in :
- (1) 1984
 - (2) 1986
 - (3) 1992
 - (4) 1990

ANSWERS KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	2	3	1	2	1	3	1	3	1	2	3	1	2	1	1	3	4	2	2	1
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	4	1	3	3	1	2	4	4	4	2	1	3	2	4	4	4	3	1	1	2
Que.	41	42	43	44	45	46	47													
Ans.	1	1	1	1	4	1	4													