18 Biotechnology And Its Application

BASIS OF CLASSIFICATION

1. Biotechnology mainly deals with **[pg-207,E]**
   A) Industrial scale production of biopharmaceutical
   B) Biological use of genetically modified microbes, fungi, plants and animals
   C) Both A and B
   D) None of these
2. Which of the following is not included in the application of biotechnology- **[pg-207,E]**
   A) Waste treatment
   B) Conventional hybridisation
   C) Energy production
   D) Genetically modified crops
3. Application like bioremediation, processed food, therapeutics and diagnostics are related to **[pg-207,E]**
   A) Biochemistry
   B) Microbiology
   C) Biotechnology
   D) Medical Science
4. ____ is/are the critical research area(s) of biotechnology. **[pg-207,E]**
   A) Creating optimals conditions for catalyst function
   B) Providing best catalyst
   C) Developing down streaming processing technique
   D) All of the above

PARAGRAPH- 12.1 BIOTECHNOLOGY APPLICATIONS IN AGRICULTURE

5. Which of the following is not for increasing food production? **[pg-208,E]**
   A) Agrochemical based agriculture
   B) Organic agriculture
   C) Genetic engineered crop-based agriculture
   D) None of these
6. Organic agriculture is a technique of raising crops for **[pg-208,M]**
   A) increased food production
   B) reduction in required labour
   C) increasing the use of agrochemicals
   D) Both A & C
7. Use of genetically modified crops in crop field may **[pg-208,M]**
   A) reduce the harmful effects of fertilizers
   B) maximize yield
   C) be environment friendly
   D) All of the above
8. Plants bacteria, fungi and animals whose genes have been altered by manipulation are called **[pg-208,M]**
   A) Pest resistant organism
   B) Hybrid organisms
   C) Genetically modified organism
   D) Insect resistant organism
9. Golden rice is genetically modified crop plant with incorporate gene meant for biosynthesis of **[pg-208,M]**
   A) Vitamin E B) Vitamin K
   C) Omega-3 D) Vitamin A
10. ____ produced by Bacillus thuringiensis **[pg-208,E]**
    A) t- toxin B) Bt toxin
    C) An acid D) All of these
11. The bacterium Bacillus thuringiensis produce ____ plants which reduces the amount of ____ used. **[pg-208,M]**
    A) disease resistant, insecticide
    B) insect resistant, fertilizers
    C) disease resistant, industrial enzyme
    D) insect resistant, insecticide
12. Which of the following crops are modified using Bacillus thuringiensis? **[pg-208,E]**
    A) Corn and cotton
    B) Tomato and rice
    C) Potato and soyabean
    D) All of the above
13. Which of the following is being grown in India by farmers as Bt crop? **[pg-208,E]**
    A) Maize B) Brinzal
    C) Cotton D) Soyabean
14. By inserting a piece of DNA from ____ insect resistant transgenic cotton has been produced. **[pg-208,H]**
    A) a wild relative of cotton

B) bacterium
C) an insect
D) virus

15. Some strains of Bacillus thuringiensis produce proteins that will insect like **[pg-208,H]**
A) Lepidopterans B) Coleopterans
C) Dipterans D) All of these

16. Coleopterans examples are/is- **[pg-208,E]**
A) Flies B) Mosquitoes
C) Beetles D) All of the above

17. Bacillus thuringiensis forms protein crystals which contain a- **[pg-208,H]**
A) Simple protein
B) Non-toxic insecticidal protein
C) Toxic insecticidal protein
D) Simple lipids

18. Why does Bt toxin protein crystal not kill the Bacillus? Because- **[pg-208,M]**
A) Bacteria encloses toxins in special sac
B) Bacteria are resistant to toxin
C) Toxin occurs as inactive protoxins in bacteria
D) All of the above

19. Bt toxin kills insect by- **[pg-209,M]**
A) Inhibiting protein synthesis
B) Generating excessive heat
C) Creating pores leading to cell swelling and lysis in the mid gut epithelial cells
D) None of these

20. The choices of genes of Bacillus thuringiensis, incorporated in to crop depends upon **[pg-209,M]**
A) Crop B) Targeted pest
C) Both A and B D) Toxin

21. The crops having cry genes need **[pg-209,M]**
A) Small amount of fungicide
B) Large amount of pesticide
C) Small amount of insecticide
D) None of the above

22. The Bt toxin protein **[pg-209,E]**
A) Obstruct a biosynthetic pathway
B) Causes death of the insect
C) Stops egg laying of adult
D) Generating excessive heat

23. Cotton bollworm controlled by- **[pg-209,M]**
A) Cry I Ac, Cry II Ab
B) Cry I Ac, Cry II Ac, Cry I Ab
C) Cry II Ac, Cry I Ab
D) Cry I Ab

24. Bt corn has been made resistant to corn borer by the introduction of gene **[pg-209,H]**
A) Cry I Ac B) Cry II Ab
C) Cry I Ab D) Cry II Ac

25. Cry II Ab and Cry I Ab produces toxins that control **[pg-209,M]**
A) Cotton bollworms and corn borer resp.
B) Cotton bollworm and budworms of tobacco resp.
C) Corn borer and cotton bollworms resp.
D) Nematodes and tobacco budworms resp.

26. Which of the following nematodes infects the root of the tobacco plants which reduces the production of tobacco? **[Pg-209,H]**
A) *Melodiogyne incognitia*
B) *Ascaris*
C) *Wuckereria*
D) *Interobious*

27. A Novel strategy was adopted to present *Meloidiogyne incognita* infection in tobacco plants that was based on the process of **[Pg-209,M]**
A) DNA interference
B) RNA interference
C) RNA initiation
D) DNA initiation

28. Resistance against a Nematode was introduce by implying RNA in ____ plants. **[pg-209,E]**
A) Tomato B) Bt corn
C) Bt cotton D) Tobacco

29. RNAi stand for **[pg-209,E]**
A) RNA inteteron
B) RNA interference
C) RNA inactivation
D) RNA initiation

30. RNAi take place in all ____ organisms as method of ____. **[pg-209,M]**
A) prokaryotes, insect resistant
B) eukaryotes, insect resistant
C) eukaryotes, cellular defence

D) prokaryotes, cellular defence

31. ____ is used for silencing of an unwanted gene **[Pg-209,M]**
A) RNA
B) DNA polymerase
C) Restriction enzyme
D) All of these

32. Silencing of mRNA molecule in order to control the production of a harmful protein has been used in the protection of plants from **[Pg-209,H]**
A) Beetles B) Armyworm
C) Budworm D) Nematodes

33. Transposons are also known as **[Pg-209,E]**
A) Silenced gene
B) Plesotropic genes
C) Mobile genetic elements
D) Both A and C

34. Tobacco plant resistant to a nemotode have been developed by the introduction of DNA and it is produced in the lost cells as **[Pg-209,M]**
A) A particular hormone
B) Toxic protein
C) Both sense and antisense RNA
D) An antifeedant

PARAGRAPH-12.2 BIOTECHNOLOGY APPLICATIONS IN MEDICINE

35. The first human hormone produced by recombinant technology is **[Pg-210,E]**
A) Oestrogen B) Progesterone
C) Thyroxine D) Insulin

36. The demerits of using bovine insulin (from cow) and porcine insulin (from pig) in diabetic patients is- **[Pg-211,M]**
A) It leads to hypercalcemic
B) It may cause allergic reaction
C) It is expensive
D) All of the above

37. The two polypeptides of human insulin are linked together by **[Pg-211,M]**
A) Phosphodiester bonds
B) Disulphide bridge
C) Hydrogen bonds
D) None of the above

38. ____ is removed during the maturation of proinsulin to insulin. **[Pg-211,H]**
A) A-chain B) B-chain
C) C-chain D) Both A and B

39. The main challenge for production of insulin using rDNA techniques was **[Pg-211,M]**
A) Splitting A and B- peptide chains
B) Addition of C- peptide to proinsulin
C) Getting insulin assembled to mature form
D) Removal of C- peptide from active insulin

40. Which of the following companies prepared human insulin in 1983? **[Pg-211,E]**
A) Monsanto B) Eli Lily
C) Genetech D) GEAC

PARAGRAPH-12.2.2 GENE THERAPY

41. Treatment of genetic disorder by manipulating gene is called- **[Pg-211,M]**
A) Gene therapy
B) rDNA technology
C) Bone marrow transplantation
D) Enzyme replacement therapy

42. For the first time, therapy was tried on a 4 year old girl in 1990 to treat ____. **[Pg-211,E]**
A) Cytosine Deaminase (CDA)
B) Adenosine Deaminase (ADA)
C) Tyrosine oxidase
D) Glutamate tryhydrogenase

43. Which kind of therapy was given in 1990 to 4 year old girl with enzyme deficiency? **[Pg-211,E]**
A) Gene therapy
B) Chemotherapy
C) Immunotherapy
D) Radiation therapy

44. Adenosine deaminase (ADA) deficiency can be treated by ____ and ____ but it is not fully curative. Here A and B can be **[Pg-211,M]**
A) A- gene therapy, B- radiation therapy
B) A- bone marrow transplantation, B- enzyme replacement therapy
C) A- organ transplantation, B- hormone replacement
D) A- radiation therapy, B- enzyme replacement therapy

45. The advantage of beginning gene therapy prior to birth is- **[Pg-211,H]**
A) The body would not reject it as it has not yet recognised 'self'.
B) This would give the body plenty of time.
C) The cell being extremely young are more receptive to gene therapy.
D) None of these

PARAGRAPH-12.2.3 MOLECULAR DIAGNOSIS

46. Why using conventional method for diagnosis is not very relevant? **[Pg-212,M]**
A) Early detection is not possible
B) Not reliable
C) Results are incorrect
D) All of these

47. Which of the following molecular diagnostic technique is used to detect the presence of a pathogen in its early stage of infection- **[Pg-212,E]**
A) Angiography
B) Radiography
C) Enzyme replacement technique
D) Polymerase chain reaction

48. Why PCR is used? **[Pg-212,E]**
A) to detect HIV in suspected AIDS patients
B) to detect Mutation in the genes of suspected cancer patients
C) Diagnose many genetic disorders
D) All of the above

49. A single stranded Nucleic acid tagged with a radioactive molecule is called **[Pg-212,E]**
A) Plasmid
B) Probe
C) Vector
D) Selectable market

50. In which of the following method, a probe is allowed hybridise to its complementary DNA in the clone of cells? **[Pg-212,M]**
A) Enzyme linked Immono sorbent Assay (ELISA)
B) PCR
C) Autoradiography
D) Gene therapy

51. Technique used to detect mutation in genes is known as- **[Pg-212,E]**
A) Gel electrophoresis
B) PCR
C) Gene therapy
D) Autoradiography

52. Which of the following technique is based on the principle of antigen – antibody interaction? **[Pg-212,H]**
A) PCR
B) ELISA
C) Recombinant DNA technology
D) Gene therapy

PARAGRAPH-12.3 TRANSGENIC ANIMALS

53. Animals whose DNA is manipulated to possess and express an extra (foreign) gene are known as **[Pg-212,E]**
A) Transgenic animals
B) Hybrid animals
C) Transferrin animals
D) All of the above

54. Transgenic animals are those which have foreign? **[Pg-212,M]**
A) DNA in all of their cells
B) Proteins in all of their cells
C) RNA in all their cells
D) RNA in some of their cells

55. 95% of all the existing transgenic animals are **[Pg-212,E]**
A) Pigs B) Cows
C) Mice D) All of these

56. Transgenic animals can be used to **[Pg-212,213,E]**
A) Study normal physiology
B) Study the biological effects
C) Study the vaccine safety
D) All of the above

57. Transgenic animals made to serve as models for human diseases. The disease are- **[Pg-213,M]**
A) Alzheimer's disease
B) Cancer
C) Cystic fibrosis
D) All of these

58. Which of the following transgenic human protein products development are used to treat emphysema? **[Pg-213,H]**
A) α-1 antitrypsin B) α-1 trypsin

C) α-1 albumin D) α-1 globulin

59. When was the first transgenic cow, Rosie produced? **[Pg-213,E]**
A) 1979 B) 1997
C) 1996 D) 1999

60. ____ was introduced in the first trans genetic cow- **[Pg-213,M]**
A) α-1 antirypsin
B) Human β-Lactalbumin
C) β-1 antitrypsin
D) None of these

61. The first transgenic cow, Rosie produced **[Pg-213,H]**
A) Human calcium enriched milk (2.4 g/l)
B) Human protein enriched milk (2.4 g/l)
C) Human calcium enriched milk (2.6 g/l)
D) Human protein enriched milk (2.8 g/l)

62. ____ are used in testing safety of polio vaccine before they are used on human. **[Pg-213,E]**
A) Transgenic pig
B) Transgenic monkey
C) Transgenic rabbits
D) Transgenic mice

63. ____ animals are made that carry genes which makes them more sensitive to toxic substances than non-transgenic animals. **[Pg-213,M]**
A) Transgenic B) Mutaled
C) Transverred D) Transformed

PARAGRAPH-12.4 ETHICAL ISSUE

64. Which committee takes decision regarding the validity of GM research and the safety of introducing GM-organisms for public services? **[Pg-213,E]**
A) Indian Council of Medical Research (ICMR)
B) Genetic Engineering Approval committee (GEAC)
C) Indian Institute of Science Education and Research (IISER)
D) Genetic Engineering Appraisal Committee (GEAC)

65. A ____ granted to a person who has either invented a new and useful product, made improvement existing product or invented a new process of making a product is called- **[Pg-214,M]**
A) bioethics
B) patent
C) bio piracy
D) genetic recombination

66. Bio patent means **[Pg-214,E]**
A) Right to use an invention
B) Right to use application are processes
C) Both A and B
D) None of these

67. ____ have been present in India from long time yet foreign country got patent through the US patent and Trademark office. **[Pg-214,M]**
A) Brown rice B) Basmati rice
C) Co-667 D) All of these

68. Bioethics is- **[Pg-214,E]**
A) Process of discovery and commercialisation of new products.
B) Use of bio resources with proper authorisation.
C) Standards used to regulate human activities in relation to the biological world.
D) All of these

69. Exploitation of bio resources of a nation by multinational companies without authorisation from the concerned country is referred to- **[Pg-214,E]**
A) Bioethics
B) Bioweapon
C) Bio piracy
D) Bio-exploitation

70. Bio piracy is related with the- **[Pg-214,E]**
A) Stealing of bio resources
B) Traditional knowledge and utilization
C) Biomolecules and regarding bio resources exploitation
D) Both A and C

71. ____ was taken by Indian parliament to meet and fulfill the requirements of patent terms and other emergency provisions in this regard? **[pg-214,E]**
A) Indian patents bill
B) Bioethics act
C) Bio piracy act
D) All of these

72. Basmati is unique for its aroma and flavour, whose __A__ documented verities cultivated in __B__. **[pg-214,E]**

A) A-37, B-India
B) A-27, B-India
C) A-27, B-USA
D) A-30, B-USA

Answer Key
BIOTECHNOLOGY & ITS APPLICATION

Q	01	02	03	04	05	06	07	08	09	10
Ans	**C**	**B**	**C**	**D**	**D**	**A**	**D**	**C**	**D**	**B**
Q	11	12	13	14	15	16	17	18	19	20
Ans	**D**	**D**	**C**	**B**	**D**	**C**	**C**	**C**	**C**	**C**
Q	21	22	23	24	25	26	27	28	29	30
Ans	**D**	**B**	**A**	**C**	**A**	**A**	**B**	**D**	**B**	**C**
Q	31	32	33	34	35	36	37	38	39	40
Ans	**A**	**D**	**C**	**C**	**D**	**B**	**B**	**C**	**C**	**B**
Q	41	42	43	44	45	46	47	48	49	50
Ans	**A**	**B**	**A**	**B**	**C**	**A**	**D**	**D**	**B**	**C**
Q	51	52	53	54	55	56	57	58	59	60
Ans	**B**	**B**	**A**	**A**	**C**	**D**	**D**	**A**	**B**	**D**
Q	61	62	63	64	65	66	67	68	69	70
Ans	**B**	**D**	**A**	**B**	**B**	**C**	**B**	**A**	**C**	**D**
Q	71	72								
Ans	**A**	**B**								