

Questionbank Biology

Unit-IX**Chapter-12. Biotechnology & its applications****IMPORTANT POINTS**

- Biotechnology is a field of applied biology that involves the use of living organisms and bioprocessors in engineering, technology, medicine and other fields requiring bioproducts. A genetically modified organism (GMO) is an organism whose genetic material has been altered using genetic engineering technique. GM plants are pest resistance, herbicide tolerance, disease resistance, cold, drought, salt and heat tolerance and with enhanced nutritional value of food eg. Vitamin A enriched rice.
- Importing the property of pest resistance through the transfer of gene from *Bacillus thuringiensis* (Bt) into target plant through modern biotech method is presently considered to be one of the most advanced application of biotechnology.
- The field of biotechnology has introduced techniques like gene therapy; recombinant DNA technology and polymerase chain reaction which use genes and DNA molecules to diagnose diseases and insert new and healthy genes in the body which replace the damaged gene or DNA. Gene therapy may be defined in broad general terms as “introduction of normal functional gene into cells; in order to replace defective or mutated gene.”
- Gene therapy may be classified into (1) germline therapy and (2) somatic cell gene therapy.
- Transgenesis refers to the phenomenon of introduction of exogenous DNA into the genome of an animal to create and maintain a stable heritable character. The foreign DNA introduced is called transgene. And the animal whose genome is altered by adding one or more transgenes is said to be transgenic animal.
- Bioethics may be viewed as a set of standards that may be used to regulate our activities in relation to the biological world.
- A patent is the right granted by the government to prevent others from commercial use of researcher's invention. Patents for bioscientific researches are called biopatents.
- When big organizations and multinational companies exploit patent biological resources or bioresources of other nations without proper authorization from the countries concerned; such exploitation is called biopiracy. While Biosafety is the presentation of large scale loss of biological integrity, focusing both on ecology and human health.

1. In which of the following industrial areas biotechnology is applicable?

(a) Health care	(b) Environment
(c) Agriculture	(d) all of the above
2. Due to what food supply has increased during green revolution?

(a) use of chemicals	(b) use of biochemicals
(c) use of photochemicals	(d) use of agrochemicals
3. The organizations whose genetic material has been altered using genetic engineering is called as -

(a) Genetically mutant organism	(b) Genetically modern organism
(c) Genetically modified organism	(d) Genetically transferred organism.

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4. Full form of GMO is -
 - (a) Genetically mutant organism
 - (b) Genetically modern organism
 - (c) Genetically modified organism
 - (d) Genetically transferred organism
5. Which of the following is responsible for causing disease in plants?
 - (a) virus
 - (b) pesticide
 - (c) Herbicide
 - (d) all the above
6. Bt stands for -
 - (a) Biotechnology
 - (b) Bacteria tolerant
 - (c) Bacillus thuringiensis
 - (d) Bollworm toxin
7. Where from Bt toxin gene has been obtained?
 - (a) plants
 - (b) virus
 - (c) Bacteria
 - (d) Fungi
8. In which of the following plant Bt toxin gene is expressed?
 - (a) Bt cotton
 - (b) Bt corn
 - (c) Bt Brinjal
 - (d) All the above
9. Toxin proteins produced by the bacterial gene destroys -
 - (a) Aphids
 - (b) grass hoppers
 - (c) Boll worms
 - (d) Beetles
10. The toxin produced by the Bt is coded by a gene named as -
 - (a) Cry
 - (b) Cry Protein
 - (c) Cyr
 - (d) Cyr Protein
11. Which of the following techniques use genes and DNA molecules for diagnoses of diseases?
 - (a) Gene therapy
 - (b) Recombinant gene technology
 - (c) Polymerase chain reaction
 - (d) All the above
12. What were the earlier sources of Insulin?
 - (a) cattle and pig
 - (b) camel and pig
 - (c) cattle and dog
 - (d) goat and pig
13. Which technology was used to produce human Insulin in E. coli ?
 - (a) Gene therapy
 - (b) Recombinant gene technology
 - (c) Polymerase chain reaction
 - (d) All the above
14. Which therapy is used for modification of germ cells (sperms and eggs)?
 - (a) sperm line therapy
 - (b) Germ line therapy
 - (c) Egg line therapy
 - (d) Germ line gene therapy
15. Modifications by germ line gene therapy are heritable as -
 - (a) The Functional gene is incorporated into to their genome.
 - (b) The Functional gene is incorporated into one of the gene.
 - (c) The Functional gene is incorporated into somatic cells.
 - (d) All the above

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16. In which therapy, vectors are used to introduce desired gene into the body of patients?
 - (a) In vivo, gene therapy
 - (b) Germ line therapy
 - (c) Ex vivo gene therapy
 - (d) Foreign gene therapy
17. The method during which genetic characteristics of animals are improved by mating of selected breeds is known as -
 - (a) Improved breeding
 - (b) selective breeding
 - (c) mating
 - (d) Breeding
18. The Phenomenon of introduction of exogenous DNA into the genome of animals is -
 - (a) In vivo, gene therapy
 - (b) Foreign gene therapy
 - (c) Ex vivo gene therapy
 - (d) Transgenesis
19. The animals whose genome is altered by introduction of transgene is known as -
 - (a) modified animals
 - (b) Hybrid animals
 - (c) cross breed animals
 - (d) Transgenic animal
20. Transgene introduced in the first transgenic cow was responsible for the production of
 - (a) Albumin enriched milk
 - (b) Protein enriched milk
 - (c) Human protein enriched milk
 - (d) Vitamins enriched milk
21. What was the amount of Alpha-lactalbumin in the milk of transgenic cow ?
 - (a) 4.2 grams per litre
 - (b) 2.4 grams per litre
 - (c) 3.4 grams per litre
 - (d) 4.2 grams per litre
22. Earlier which animals were used to test the safety of Polio Vaccine
 - (a) Transgenic rat
 - (b) Transgenic pigs
 - (c) Transgenic mice
 - (d) Transgenic sheep
23. The right granted by government to prevent others from the commercial use of resources invention is -
 - (a) Government grant
 - (b) Patent
 - (c) official document
 - (d) Biopatent
24. Exploitation of Patent of biological resources of other nations is called as -
 - (a) Biosafety
 - (b) Biopiracy
 - (c) Biowar
 - (d) Bioabuse
25. Organisms which can be used to gain commercial benefits are called -
 - (a) Beneficial resources
 - (b) Bioresources
 - (c) Financial resources
 - (d) Biological resources
26. The plant Pentadiplandra brazzeana belongs to which country ?
 - (a) China
 - (b) West Africa
 - (c) Pakistan
 - (d) America

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27. Which technology facilitates the production of novel DNA molecule by combining sequences from DNA from two different organisms ?
 (a) gene therapy (b) Recombinant DNA technology
 (c) Polymerase chain reaction (d) germ line gene therapy
28. Which is the most common bioinsecticide for the protection of cotton ?
 (a) Pyrethrin (b) Rotenone (c) Eicer (d) Bacillus thuringiensis
29. Which of the following can be controlled with the help of biopesticides ?
 (a) Insects (b) Diseases (c) Weeds (d) All the above
30. Transgenic animals are produced by incorporation of Foreign gene into the -
 (a) Nucleus of fertilized egg (b) Nucleus of sperm
 (c) Nucleus of unfertilized egg (d) Egg cell
31. The bacteria associated with plant genetic engineering are -
 (a) salmonella and Pseudomonas
 (b) Salmonella typhimurium and agrobacterium
 (c) Bacillus thuringiensis and Pseudomonas fluorescens
 (d) Both b and c
32. The science of biotechnology has contributed to field of
 (a) Health (b) Pharmacy
 (c) agriculture and industry (d) all above
33. The method of producing proteins for food or feed through microbial biomass is called
 (a) PCR (b) SCP (c) Nanotechnology (d) None of above
34. The insulin prepared through genetic engineering is called
 (a) Human insulin (b) microbial insulin
 (c) Bio insulin (d) Humulin
35. The most common Bioinsecticide in present in the world for protection and mustard is——
 (a) Pyrethrin (b) Bt. , (c) Rotenone (d) none of these
36. First progress in field of genetic engineering, in 1978 by Cohen, Berg and Boyer by synthesis of——
 ————through E. coli
 (a) Insulin (b) growth hormone (c) Somatostatin (d) both b and c
37. Which was the first product contributed to human kind by science of Biotechnology in early 1972
 (a) somatotropin (b) Insulin (c) cytokines (d) erythropoietin
38. Which is the most common Plasmid used for most of genetically engineered product ?
 (a) PBR322 (b) R Plasmid types (c) CaMV195 (d) both a and b

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39. The main use of recombinant DNA technology are.....
 (a) production of transgenic humans.
 (b) the creation of cells capable of synthesizing economically important molecules.
 (c) the efficient reduction of useful proteins.
 (d) both b and c
40. Biofuel is made by utilizing which strain of bacteria ?
 (a) *Bacillus amyloliquefaciens* (b) *Klebsiella Planticola*
 (c) *E. coli* (d) *Phanerochaete chrysosporium*
41. Bio augmentation is
 (a) the addition of commercially prepared bacterial strain
 (b) Production of fertilizers by using bacteria
 (c) the metals are deposited as insoluble oxides and sulphides by activities of bacteria
 (d) removal of pests
42. Which of the following animal is best known genetically ?
 (a) Planaria (b) Domestic dog
 (c) *Musca domestica* (d) *Drosophila melanogaster*
43. Which one is a transgenic crop ?
 (a) Brinjal (b) Potato (c) Grape (d) Tomato
44. First transgenic mouse grew twice the normal size after drinking _____ containing water.
 (a) Cu (b) Fe (c) Zn (d) Ra
45. The genetically modified crops introduced in India are ...
 (a) cotton (b) mustard (c) Wild plant (d) Both a and b
46. One of the following is the correct sequence to make a transgenic animals.
 (a) Transomics – transfection – micro infection – electro portion – retroviral vectors
 (b) Micro injection - transfection - electro portion - retroviral vectors - transomics
 (c) Transfection – micro injection - transomics - electro portion - retroviral vectors
 (d) None of these
47. one of the following is transgenic organisms
 (a) Holly sheep and tomato (b) Dolly sheep and subabul
 (c) Molly sheep and banana (d) B T cotton and tomato (Flaur saur)
48. Transgenic plants are produced by using Ti Plasmids from the
 (a) *Agrobacterium tumefaciens* (b) *E. coli*
 (c) Bacteriophage (d) *Agrobacterium varians*

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49. Vaccine is a
- collection of antibiotics
 - collection of life saving drugs
 - collection of killed disease causing bacteria and virus
 - collection of lysins
50. The typical machine for production of bio-products through microbial is
- sterilized glass ware
 - microprojectile
 - autoclave
 - Fermenter
51. The foods made from genetically modified crops required to Pass human testing because
- they may cause allergies
 - they may alter genes
 - they may cause mutations and release toxins
 - all above
52. There are set of health care products. Match them with organisms which are genetically engineered for respective products.
- | | |
|-----------------|-------------------------------------|
| A. Insulin | 1. Escherichia coli / saccharomyces |
| B. Somatotropin | 2. Escherichia coli / yeast |
| C. Interferon | 3. G M E coli |
| D. Interleukins | 4. hGH in E. coli |
| | 5. Humulin through E. coli |
- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 5 | 4 | 1 | 2 |
| (b) | 5 | 1 | 1 | 4 |
| (c) | 5 | 3 | 4 | 1 |
| (d) | 5 | 4 | 3 | 2 |
53. Pick up the correct set.
- | | |
|-----------------------|--|
| A. Spirulina | 1. Non surfacetant polymers for oil recovery |
| B. Monilia / Fusarium | 2. SCP |
| C. Methanobrevibacter | 3. Ethanol from carbohydrates |
| D. Aureobasidium | 4. Curd formation |
| | 5. Biogas formation |
- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 2 | 3 | 5 | 1 |
| (b) | 2 | 5 | 4 | 1 |
| (c) | 2 | 4 | 3 | 5 |
| (d) | 2 | 1 | 4 | 5 |

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Assertion – reason type of Questions

- (a) Both A & R true. R is explanation of A
 (b) Both A & R true but R is explanation of A
 (c) A is wrong R is true.
 (d) A is wrong R is wrong.
 (e) A is right R is wrong.
54. A – some bacteria produce vit. B₁₂
 R – vitamins are obtained when they are alive
 (a) (b) (c) (d)
55. A – second generation vaccines are safer to use.
 R – They are produced by genetic engineering.
 (a) (b) (c) (d)
56. A – Vitamin B₂ is found in cereals, green vegetables, brewer's yeast, milk and liver.
 R – It can be commercially produced by some yeast.
 (a) (b) (c) (d)
57. Tissue culture technique has been biotechnologically successful in production of -
 (a) alcoholic beverages (b) cheese (c) shikonin (d) Insulin
58. Yeast is a good source of
 (a) carbohydrates (b) vitamin B (c) Proteins (d) both b and c
59. The micro – organism involved in making bread is
 (a) Acetobacter (b) brewer's yeast
 (c) Saccharomyces cerevisiae (d) None of the above
60. Penicillin is obtained from -
 (a) Mushroom (b) viruses (c) Bacteria and viruses (d) Penicillium notatum
61. A bioreactor refers to
 (a) Fermentation tank (b) organisms reacting to stimuli
 (c) Nuclear reactor for biochemical reactions (d) Tank & biochemical reactions
62. Cells obtained from cancerous tumours are known as -
 (a) myelomas (b) hybridomas (c) Lymphocytes (d) Monoclonal cells
63. Hybridomas are employed for
 (a) synthesis of antibiotics (b) Killing cancer cells
 (c) synthesis of monoclonal antibodies (d) Production of somatic hybrids
64. Antibiotics inhibit the growth or destroy
 (a) Bacteria and fungi (b) Bacteria and viruses
 (c) Bacteria, algae and viruses (d) Bacteria, fungi and viruses

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65. Which of the following is not concerned with biotechnology ?
- (a) Biogas Production (b) Sewage treatment
- (c) Biofertilizers (d) Wood seasoning

ANSWER KEY

1	d	17	b	33	b	49	c
2	d	18	d	34	d	50	d
3	c	19	d	35	b	51	d
4	c	20	c	36	d	52	a
5	a	21	b	37	a	53	a
6	c	22	c	38	d	54	b
7	c	23	d	39	d	55	b
8	a	24	b	40	a	56	b
9	a	25	b	41	a	57	c
10	b	26	b	42	d	58	c
11	d	27	b	43	d	59	c
12	a	28	d	44	c	60	d
13	d	29	d	45	d	61	d
14	d	30	a	46	b	62	a
15	a	31	d	47	d	63	c
16	a	32	d	48	a	64	d
						65	d

