



# **BIOLOGY**

## **BOOKS - MBD BIOLOGY (ODIA ENGLISH)**

### **APPLICATION OF BIOTECHNOLOGY IN HEALTH AND AGRICULTURE**

**Question Bank**

1. How many recombinant therapeutics have been approved for human use the world over ?

A. 12

B. 30

C. 20

D. 18

**Answer: B**



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2. Which of the following techniques serve the purpose of early diagnosis ?

(1) Recombinant DNA technology

(2) PCR

(3) ELISA

A. 1 only

B. 1 and 3 only

C. 1 and 2 only

D. 1, 2 and 3

**Answer: D**





3. Which of the following techniques is based upon the principle of antigen-antibody interaction ?

A. PCR

B. ELISA

C. Recombinant DNA technology

D. RNA interference

**Answer: B**

4. Which of the following transgenic protein product has been used to treat emphysema ?

A.  $\alpha$ -1-antitrypsin

B.  $\alpha$ -Lactalbumin

C. Cry protein

D. C-peptide

**Answer: A**

5. Bt toxin gene has been cloned from the bacteria and expressed in plants to provide resistance to insects without the need for insecticides. Select these resistant plants from the given list.

- |            |               |
|------------|---------------|
| (i) Cotton | (ii) Corn     |
| (iii) Rice | (iv) Tomato   |
| (v) Potato | (vi) Soyabean |

A. (i), (ii), (iii) and (iv)

B. (ii), (iii), (iv) and (v)

C. (i), (ii), (v) and (vi)

D. All of these

**Answer: D**



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**6.** Which of the following is / are correct about the process of RNA interference ?

(i) This is used to prevent the infestation of protozoans.

(ii) it takes place in some eukaryotic and all

prokaryotic organisms as a method of cellular defense.

(iii) The method involves silencing of a specific mRNA due to a complementary dsRNA molecule.

(iv) It is novel strategy to produce pest resistant plant

A. (iii) and (iv)

B. (ii), (iii) and (iv)

C. (i) and (iii)

D. (iii) only



**Answer: A**



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7. Which ingredient was present in high concentrations in genetically modified (GM) rice as compared to the usual rice ?

A. Protein

B. Carbohydrates

C.  $Na^+$  ions

D. Vitamin A

**Answer: D**



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**8.** Animals that have had their DNA manipulated to possess and express an extra gene are known as:

- A. Foreign animals
- B. Superior animal
- C. Transgenic animal
- D. Intergenic animal

**Answer: C**



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**9.** About 95 per cent of all existing transgenic animals are\_\_\_\_\_ ?

A. Rabbits

B. Pigs

C. Cows

D. Mice

**Answer: D**



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**10.** Today, transgenic models exist for many human diseases which includes:

- (1) Cancer
- (2) Cystic fibrosis
- (3) Rheumatoid arthritis
- (4) Alzheimer's disease

**A. 1 and 3 only**

B. 2 and 3 only

C. 1, 2 and 3 only

D. 1, 2, 3 and 4

**Answer: D**



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**11.** Which of the following is not a true statement with respect to Bt cotton ?

- A. Bt toxin is produced by a bacterium *Bacillus thuringiensis*.
- B. It is an example of bio-pesticide.
- C. Bt toxin gene has been cloned in plants to provide resistance to insects.
- D. Bt cotton could decrease the amount of pesticide used.

**Answer: C**



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12. Which protein would you like to be produced by genetic engineering as cure for diseases like emphysema ?

A.  $\alpha$ -1-antitrypsin

B. Trypsin

C. Chymotrypsin

D. All of the above

**Answer: A**



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**13.** Rosie' a transgenic cow is known to produce a type of milk which has all the following characteristics except:

A. protein content of 2.4 gm/litre

B. has human  $\alpha$ -lactalbumin

C. more balanced diet than normal cow  
milk for babies

D. was produced for the first time in year

2001



**Answer: D**



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**14.** According to the latest estimates, how many documented varieties of Basmati rice are grown in India ?

A. 30

B. 27

C. 118

D. 125

**Answer: B**



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**15.** An anti-bacterial compound that prevents mastitis in cows is:

A.  $\alpha$ -1-antitrypsin

B. Lysostaphin

C. Lysozyme

D. Alginate lyase

**Answer: B**



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**16.** Choose the incorrect statement with respect to Bioweapons.

A. They are low cost weapons.

B. They cause more casualties than conventional weapon.

C. They are extremely difficult to detect.

D. Bacterium vibrio cholera created letter  
scare in 2001.

**Answer: D**



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**17.** A set of standards by which a community regulates its behaviour and activities in relation to the biological world is termed as:

A. Biopatent

B. Biopiracy

C. Patent

D. Bioethic

**Answer: D**



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**18.** Nexia biotechnologies spliced spider genes into the cells of lactating:

A. Cow

B. Sheep

C. Goat

D. None of these

**Answer: C**



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**19.** How many varieties of rice has been estimated to be present in India ?

A. 2000

B. 20000

C. 200000

D. 2000000

**Answer: C**



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**20.** The use of bioresources by multinational companies and other organisations without proper authorisation from the countries and

people concerned without compensatory payment is called:

A. Bioethics

B. Biopiracy

C. Bioterror

D. Bioweapon

**Answer: B**



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21. Among the following which characteristics is not applicable to Bt cotton ?

A. Bt is the abbreviated term for botulinum toxin.

B. Such a cotton is resistant to worm and beetles.

C. The toxin is activated in the body of the insect.

D. The toxin is coded by a gene called 'cry'.

**Answer: A**



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**22.** Which biotechnology company is credited with the synthesis of genetically engineered human insulin for the first time ?

A. Celera genomics

B. Cipla

C. Eli Lilly

D. Ranbaxy

**Answer: C**



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**23. Pick the odd one out.**

A. DNA micro-injection

B. RNA interference

C. Retro virus mediated gene transfer

D. Embryonic stem cell-mediated gene transfer

**Answer: B**



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24. In genetransplantation, a protein that causes graft rejection comes usually from transgenic\_\_\_\_\_.

A. Cow

B. Mice

C. Pig

D. Sheep

**Answer: C**



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**25.** Transgenics have provided many pharmaceuticals in their milk, for treatment of diseases. Which of the following has not been a successful story ?

A. Phenylketonuria

B. SCID

C. Emphysema (hereditary)

D. CFTR

**Answer: B**



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**26.** Which is not true w.r.t. transgenic animals and their contribution to human welfare ?

A. Transgenic mice are being tested to ensure safety of polio vaccine.

B. Rosie's milk contained human  
gene insulin

C. Transgenic cows produce milk with less  
lactose.

D. Transgenic sheep grow more wool.

**Answer: B**



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27. The functional ADA-cDNA can be introduced into the cells of the patient receiving gene therapy by using a vector constituted by:

- A. E.coli
- B. Recovirus
- C. Retrovirus
- D. Agrobacterium

**Answer: C**



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28. Which variety of rice was patented by a U.S. company even through the highest number of varieties of this rice found in India ?

A. Sharbati Sonara

B. Co-667

C. Basmati

D. Lerma Roja

**Answer: C**





**29.** Which step of Government of India has taken to cater to the requirement of patent terms and other emergency provisions in this regard ?

- A. Biopiracy act
- B. Indian patents bill
- C. RTI act
- D. Negotiable instruments act

**Answer: B**



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**30.** What is another term used for GMO(Genetically Modified Organisms) ?

- A. Cybrid organisms
- B. Germorphic organisms
- C. Transgenic organisms
- D. Conjoint twins

**Answer: C**



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**31. Which one of the following can be used as a permanent cure for ADA deficiency ?**

A. Bone marrow transplantation upon

detection of disorder in adult

B. Enzyme replacement therapy at any

point in life

C. BOTH A AND B

D. Gene therapy at early embryonic stages

**Answer: D**



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**32.** Which of the following is a transgenic product useful for treatment of Haemophilia ?

A. Factor VIII

B. Antithrombin II

C.  $\alpha$ -1-antitrypsin

D. Lysostaphin

**Answer: A**



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**33.** Who is responsible for obtaining interferons through recombinant DNA technique ?

A. A.R. Bunting

B. Eli Lilly

C. A. Tiselius

D. Charles Weissmann

**Answer: C**



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**34.** Select the incorrect statement.

A. RNAi silencing takes place in all eukaryotic organisms as a method of

cellular defense.

B. RNAi requires silencing of mRNA by binding of complementary ssDNA molecule.

C. Complementary nucleic acid could be from mobile genetic elements (transposons).

D. Ti plasmid with nematode specific genes have been used in RNAi.

**Answer: B**





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35. Identify the correct match for the given columns.

**Column-I**

**Column-II**

*a* Rosie

(i) Radioactive isotope

*b* Golden rice

(ii) Cry gene

*c* Bt cotton

(iii) Vitamin A

*d* DNA probe

(iv) First transgenic cow

A. a - (iv), b- (iii), c - (ii), d - (i)

B. a - (i), b- (iii), c - (iv), d - (ii)

C. a - (iv), b- (ii), c - (i), d - (iii)

D. a - (ii), b- (iii), c - (iv), d - (i)

**Answer: A**



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**36.** Rules of conduct that may be used to regulate our activities in relation to the biological world is called

A. Bioethics

B. biowar

C. biopatent

D. biopiracy

**Answer: A**



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**37.** Transgenic mice are being used to test the safety of:

A. polio vaccine

B. BCG vaccine

C. antitrypsin

D. hepatitis B vaccine

**Answer: A**



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**38.** Which genes encode the protein to control bollworms infection in cotton plants ?

A. Cry II Ab

B. Cry I Ac

C. BOTH A AND B

D. Ampere

**Answer: C**



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**39. Which is Incorrect w.r.t. GM foods ?**

A. It contains the protein produced by the transgene in question.

B. GM food contains antibiotic resistance gene itself.

C. The enzyme produced by antibiotics resistance gene will not cause allergies.

D. The bacteria in gut of humans could take antibiotic resistance gene.

**Answer: C**



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**40.** Golden rice - a transgenic variety of rice are principally richer than normal rice in:

A. Cry I Ab

B. Hirudin

C. TPA

D.  $\beta$ -carotene

**Answer: D**



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**41.** Southern blotting can't be performed without :

A. Restriction endonucleases

B. Agarose

C. Monoclonal antibodies

D. BOTH (A) AND (B)

**Answer: D**



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**42.** Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because:

- A. bacteria are resistant to the toxin
- B. toxin exist as toxoid
- C. toxin exist as prototoxins
- D. bacteria encloses toxin in a special sac

**Answer: C**



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**43.** What is the permanent cure of adenosine deaminase (ADA) deficiency in children ?

A. Bone marrow transplantation

B. Enzyme replacement therapy in which functional ADA is given to patient by injection

C. Infusion of genetically engineering lymphocytes ( in which functional ADA-

cDNA is introduced) into the patient's  
body

D. Introduction of gene isolated from bone  
marrow cells producing ADA, into cells at  
early embryonic stages

**Answer: D**



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**44.** Which gene controls transcription of chain A and chain B required for humalin synthesis in E.coli ?

- A.  $\beta$ -lactamase
- B.  $\beta$ -galactosidase
- C. Poly galacturonase
- D. Chitinase

**Answer: C**



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**45.** Transgenic *Brassica napus* has been used for synthesis of:

A. Hirudin

B. Heparin

C. Polygalacturonase

D. Cry protein

**Answer: A**



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46. Which one of these participates in the manufacturing of dextrans ?

A. Mucor

B. Lactobacillus

C. Leuconostoc

D. Pseudomonas

**Answer: C**



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47. Which of the following is used for manufacture of cosmetics ?

A. Serotonin

B. Cholesterol

C. Shikonin

D. Keratin

**Answer: C**



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**48.** The technique by which virus detection can be made both in plants and animals is known as:

- A. Enzyme linked immunoabsorbent assay  
(ELISA)
- B. Electrophoresis
- C. Electron microscopy
- D. Immunofluorescence

**Answer: A**



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49. Streptokinase (TPA) helps in:

A. clearing blood clots

B. increasing plasma

C. dissolving tissues

D. increasing O.P. of cell

**Answer: A**



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50. The enzyme diastase was identified by:

- A. Payen and Persoz
- B. Waksman
- C. Christian Hansen
- D. Alexander Fleming

**Answer: A**



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51. The immobilization of enzyme is achieved by:

- A. killing the cells without affecting enzyme
- B. attaching the enzymes covalently to a solid support
- C. entrapping the living cells in gel
- D. All of these

**Answer: D**



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**52. Interferons are :**

- A. Proteins released in minute quantities by animals or plant cell, on being infected with virus
- B. Proteins synthesized in large quantities by cell actively engaged in synthesis
- C. Hormones released by cell in small quantities which influence some of the various physiological activities
- D. Defensive mechanism

**Answer: A**



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**53.** Magic bullets are:

A. interferons

B. vaccines

C. Monoclonal antibodies

D. antigen-antibody cells

**Answer: C**



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**54.** Cheese contains:

A. protein 20-30%, fats 20-3%

B. fats 20 – 35 % , protein 20 – 30 %

C. proteins double than fats

D. fats double than proteins

**Answer: A**



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55. The hybridoma technique was developed by:

A. Louis Pasteur

B. Edward Jenner

C. Georges Kohler and Caser Milstein

D. Bumet

**Answer: C**



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**56.** Some of the steps involved in the production of humulin are given below.

Choose the correct sequence.

(i) Synthesis of gene (DNA for human insulin artificially).

(ii) Culturing recombinant E.coli in bioreactors.

(iii) Purification of humulin.

iv Insertion of human insulin gene into plasmid

(v) Introduction of recombinat plasmid into E.coli

(vi) Extraction of recombinant gene product from E.coli.



A. ii, i, iv, iii, v, vi

B. i, iii, v, vi, ii, iv

C. i, iv, v, ii, vi, iii

D. iii, v, ii, i, vi, iv

**Answer: C**



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**57. BT cotton is not :**

A. A GM plant

B. Insect resistant

C. A bacterial gene expression system

D. Resistant to all pesticides

**Answer: D**



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**58.** C-peptide of human insulin is:

A. A part of mature insulin molecule

B. Responsible for formation of disulphide bridges

C. Removed during maturation of proinsulin to insulin

D. Responsible for its biological activity

**Answer: C**



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**59.** GEAC stands for:

A. Genome Engineering Action Committee

B. Ground Environment Action Committee

C. Genetic Engineering Approval  
Committee

D. Genetic and Environment Approval  
Committee

**Answer: C**



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**60.**  $\alpha$ -1 antitrypsin as:

A. An antacid

B. An enzyme

C. Used to treat arthritis

D. Used to treat emphysema

**Answer: D**



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**61.** A probe which is a molecule used to locate specific sequences in a mixture of DNA or RNA molecules could be:

- A. A single stranded RNA
- B. A single stranded DNA
- C. Either RNA or DNA
- D. Can be ss DNA but not ss RNA

**Answer: C**



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**62.** Choose the correct option regarding Retrovirus.

A. An RNA virus that can synthesise DNA during infection

B. A DNA virus that can synthesise RNA during infection

C. A ssDNA virus

D. A dsRNA virus

**Answer: A**



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**63.** The site of production of ADA in the body is:

A. Bone marrow

B. Lymphocytes

C. Blood plasma

D. Monocytes

**Answer: A**



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64. A protoxin is:

- A. A primitive toxin
- B. A denatured toxin
- C. Toxin produced by protozoa
- D. Inactive toxin

**Answer: D**



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**65.** Pathophysiology is the:

- A. study of physiology of pathogen
- B. study of normal physiology of host
- C. study of altered physiology of host
- D. None of the above

**Answer: C**



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**66.** The trigger for activation of toxin of bacillus thuringiensis is:

A. Acidic pH of stomach

B. High temperature

C. Alkaline pH of gut

D. Mechanical action in the insect gut

**Answer: C**



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**67.** Golden rice is:

A. A variety of rice grown along the yellow river in China

B. Long stored rice having yellow colour tint

C. A transgenic rice having gene for beta carotene

D. Wild variety of rice with yellow coloured grains

**Answer: C**



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**68.** In RNAi, genes are silenced using:

- A. ssDNA
- B. dsDNA
- C. dsRNA
- D. ssRNA

**Answer: C**



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**69.** The first clinical gene therapy was done for the treatment of:

A. SCID

B. Toxoid

C. Toxin

D. Antibiotic

**Answer: D**



70. ADA is an enzyme which is deficient in a genetic disorder SCID. What is the full form of ADA ?

- A. Adenosine deoxy aminase
- B. Adenosine deaminase
- C. Aspartate deaminase
- D. Arginine deaminase

**Answer: B**



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71. Silencing of a gene could be achieved through the use of:

- A. short interfering RNA (RNAi)
- B. antisense RNA
- C. by Both
- D. None of the above

**Answer: C**



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72. Which one of the following microorganisms is used for production of citric acid in industries ?

A. *Lactobacillus vulgaris*

B. *Penicillium citrinum*

C. *Aspergillus niger*

D. *Rhizopus nigricans*

**Answer: C**



73. Important objective of biotechnology in agriculture sector is:

- A. To produce pest resistant varieties of plants
- B. To increase the nitrogen content
- C. To decrease the seed number
- D. To increase the plant weight

**Answer: A**



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74. The main technique involved in agricultural biotechnology is called:

- A. Tissue culture
- B. Transformation
- C. Plant breeding
- D. DNA replication

**Answer: A**



75. The new strain of bacteria produced by biotechnology in alcohol industry is:

- A. *Escherichia coli*
- B. *Saccharomyces cerevisiae*
- C. *Bacillus subtilis*
- D. *Pseudomonas putida*

**Answer: D**



**76.** The basis of DNA fingerprinting is :

A. Availability of cloned DNA

B. Knowledge of human karyotype

C. Occurrence of restriction fragment length polymorphism (RFLP)

D. Phenotypic differences between individuals

**Answer: C**



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77. Genetically engineered bacterium used in production of :

- A. Thyroxine
- B. Testosterone
- C. Human insulin
- D. Melatonin

**Answer: C**



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**78.** Which of the following correctly defines a transgenic animal ?

A. An animal which has foreign DNA in all its cells because of an injection of DNA into the nuclei of the zygote from which it is developed.

B. An animal which has foreign DNA in all its cells because of an injection of DNA

into the nuclei of some of the cells in adulthood..

C. An animal which has foreign DNA and RNA in some of its cells because of an injection of DNA and RNA into the nuclei of the Zygote from which it is developed.

D. An animal which has foreign DNA in some of its cells because of an injection of DNA, into the nuclei some of the cells of the blastocyst.



**Answer: A**



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**79.** Which one of the following is not true about antibiotics ?

A. First antibiotic was discovered by Alexander Fleming.

B. The term 'antibiotic' was coined by Selman Waksman in 1942.

C. Some persons can be allergic to a particular antibiotic.

D. Each antibiotic is effective only against one particular kind of germ.

**Answer: D**



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**80. Renin used in cheese industry is:**

A. Antibiotic

B. Alkaloid

C. Enzyme

D. Inhibitor

**Answer: C**



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**81.** The organism used for alcoholic fermentation is:

A. Saccharomyces

B. Aspergillus

C. Pseudomonas

D. Pencillium

**Answer: A**



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**82.** A cell coded protein that is formed in response to infection with most animal viruses is called:

A. histone

B. vaccine

C. antibody

D. interferon

**Answer: D**



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**83.** Which of the following organelles is related with genetic engineering ?

A. Mitochondria

B. Golgi apparatus

C. Plasmids

D. Lysosomes

**Answer: C**



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**84.** A chemical substance derived from a living source that has the capacity to inhibit growth or to destroy microbes is called:

A. Vaccine

B. Toxoid

C. Toxin

D. Antibiotic

**Answer: D**



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**85.** The Central Drug Research Institute (CDRI)

is situated in:

A. New Delhi

B. Allahabad

C. Lucknow

D. Kanpur

**Answer: C**



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**86.** Wine and Beer are produced directly by fermentation and distillation because:



- A. fermentation is inhibited at an alcoholic level of 10-18%
- B. distillation prolongs storage
- C. distillation improves quality
- D. distillation purifies the beverage

**Answer: A**



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**87.** The antibiotics obtained from *Streptomyces* are:

A. Chloramphenicol, Erythromycin

B. Leucomycin, Neomycin

C. Novobiocin, Spiramycin

D. All of these

**Answer: D**



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**88.** Human insulin has 51 amino acids in two chains. Mark the correct statement.

A. A chain with 21 and B chain with 30 amino acids

B. A chain with 20 and B chain with 31 amino acids

C. A chain with 31 and B chain with 20 amino acids

D. A chain with 30 and B chain with 21 amino acids

**Answer: A**



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**89.** During "gene cloning" which is called as "gene taxi" ?

A. Vaccine

B. Plasmid

C. Bacterium

D. Protozoa

**Answer: B**



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**90.** What does Bt stand for the popular crop Bt cotton ?

- A. Biotechnology
- B. Best type
- C. Bacillus tomentosa
- D. Bacillus thuringiensis

**Answer: D**



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**91.** Name of the drug used in cancer treatment produced by using biotechnology is:

A. Terramycin

B. HGH

C. Insulin

D. interferon

**Answer: D**



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**92.** The main technique involved in agricultural biotechnology is called:

- A. Tissue culture
- B. Transformation
- C. Plant breeding
- D. DNA replication

**Answer: A**



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**93.** In genetic engineering, the antibiotics are used:

A. to select healthy vectors

B. as sequence from where replication starts

C. to keep the culture free of infection



D. as selectable marker

**Answer: D**



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**94.** Use of biology in industrial process and for improving quality of life is called:

A. Biotechnology

B. Microbiology

C. Genetic Engineering

## D. Eugenics

**Answer: A**



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**95.** What is the reason of formation of embryoid from pollen grain in tissue culture medium ?

A. Cellular totipotency

B. Organogenesis

C. Double fertilization

D. Testtube culture

**Answer: A**



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**96.** The technique of obtaining large number of plantlets by tissue culture method is called:

A. Organ culture

B. Micropropagation

C. Macropropagation

D. Plantlet culture

**Answer: B**



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**97.** Somaclonal variation can be obtained by:

A. Application of colchicine

B. Hybridisation

C. Irradiation with gamma rays

D. Tissue culture

**Answer: D**



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**98.** Cultivation of Bt cotton has been much in the news. The prefix Bt means:

A. 'Barium treated" cotton seeds

B. 'Bigger thread" variety of cotton with better tensile strength

C. Produced by "biotechnology" using restriction enzymes and ligases

D. Carrying an endotoxin gene from *Bacillus thuringiensis*

**Answer: D**



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**99.** T1 plasmid is used for making transgenic plants. It is obtained from:

A. Transgene

B. Promoter

C. Reporter

D. Enhancer

**Answer: B**



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**100.** T1 plasmid is used for making transgenic plants. It is obtained from:

A. Rhizobium of the roots of leguminous plants

B. Agrobacterium

C. Yeast as a 2 um plasmid

D. Azotobacter

**Answer: B**



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**101.** The first antibiotic was discovered by\_\_\_\_\_



A. Louis Pasteur

B. R Koch

C. W. Fleming

D. A. Fleming

**Answer: D**



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**102.** Colchicine brings about:

A. Chromosome aberrations

B. Duplication of chromosomes

C. Gene mutations

D. Quick replication

**Answer: B**



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**103.** A cybrid is a hybrid carrying:

A. Cytoplasms of two different plants

B. genomes and cytoplasms of two different plants

C. cytoplasms of two different plants and genome of one plant

D. genomes of two different plants

**Answer: C**



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104. Biogas produced by anaerobic decomposition used in combustion is mainly due to presence of:



D. None of these

**Answer: B**



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**105.** Which of the following is not an antibiotic ?

A. Aflatoxin

B. Penicillin

C. Chloromycin

D. Streptomycin

**Answer: A**



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**106.** Which raw material is used in fermentation process of making beer ?

- A. Sugar in fruits
- B. Starch in cereals
- C. Protein in pulses
- D. Starch in vegetables

**Answer: B**



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**107.** Which one of the following is the correctly matched pair of a product and the microorganism responsible for it:

- A. Ethyl alcohol - Yeast
- B. Cheese - Nitrobacter
- C. Acetic acid - Lactobacillus
- D. Curd - Azotobacter

**Answer: A**



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**108.** Hybridoma technology has been successfully used in:

- A. synthesis of haemoglobin
- B. production of alcohol in bulk
- C. production of somatic hybrids
- D. synthesis of monoclonal antibodies

**Answer: D**



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**109.** Match the types of bacteria listed under column I with their activity given in column II.

Choose the answer which given the correct combination of alphabets of the two columns:

<b>Column - I</b> (Types of bacteria)	<b>Column - II</b> (Activity)
(A) <i>Streptomyces</i> p	Food poisoning
(B) <i>Rhizobium</i> q	Source of antibiotics
(C) <i>Nitrosomonas</i> r	Nitrogen fixation
	s Nitrification
(D) <i>Acetobacter</i> t	Vinegar synthesis

A. A = q, B = r, C = p, D = t

B. A = q, B = r, C = s, D = t

C. A = s, B = t, C = p, D = r

D.  $A = t, B = p, C = r, D = s$

**Answer: B**



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**110.** India's wheat yield revolution in the 1960s was possible primarily due to:

A. Increased chlorophyll content

B. Mutations resulting in plant height reduction

C. Quantitative trait mutations

D. Hybrid seeds

**Answer: C**



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**111.** A self-fertilizing trihybrid plant from:

A. 4 different gametes and 16 different  
zygotes

B. 8 different gametes and 16 different zygotes

C. 8 different gametes and 32 different zygotes

D. 8 different gametes and 64 different zygotes

**Answer: D**



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**112.** *Bacillus thuringiensis* (Bt) strains have been used for designing novel:

- A. Bio-metallurgical techniques
- B. Bio-mineralization process
- C. Bioinsecticidal plants
- D. Biofertilizers

**Answer: C**



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**113.** Which of the following is generally used for induced mutagenesis in crop plants ?

A. Alpha particles

B. X-rays

C. UV (260nm)

D. Gamma rays (from cobalt 60)

**Answer: C**



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**114.** An institution where valuable plant material likely to become irretrievably lost in the wild or in cultivation is preserved in a viable condition is known as:

- A. Genome
- B. Gene library
- C. Gene bank
- D. Herbarium

**Answer: C**



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**115.** Hirudin is:

A. A protein produced by *Hordeum vulgare*, which is rich in lysine

B. A toxic molecule isolated from *Gossypium hirsutum*, which reduces human fertility

C. A protein produced from transgenic *Brassica napus*, which prevents blood



clotting

D. An antibiotic produced by a genetically engineered bacterium, *Escherichia coli*.

**Answer: C**



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**116.** Golden rice is a promising transgenic crop.

When released for cultivation, it will help in :

A. alleviation of vitamin-A deficiency

B. pest resistance

C. herbicide tolerance

D. producing a petrol-like fuel from rice

**Answer: A**



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**117.** Which antibiotic inhibits interaction between tRNA and mRNA during bacterial protein synthesis ?

A. Erythromycin

B. Neomycin

C. Streptomycin

D. Tetracycline

**Answer: C**



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**118.** Match List I with List II and select the correct option.

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- |                               |    |                             |
|-------------------------------|----|-----------------------------|
| (B) <i>Rhizobium meliloti</i> | 2. | Scavenging of oil spills    |
| (C) <i>Escherichia coli</i>   | 3. | Incorporate of 'nif' gene   |
| (D) <i>Pseudomonas putida</i> | 4. | Production of Bt toxin      |
| (E) <i>Trichoderma</i>        | 5. | Production of human insulin |

A. (A)-2, (B)-4, (C)-1, (D)-5, (E)-3

B. (A)-2, (B)-4, (C)-5, (D)-1, (E)-3

C. (A)-4, (B)-3, (C)-5, (D)-2, (E)-3

D. (A)-3, (B)-4, (C)-5, (D)-1, (E)-2

**Answer: C**



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**119.** Select the wrong statement.

A. Pectinase and cellulase dissolve the cell wall.

B. Some cyanobacteria form symbiotic association with the fern *Azolla*.

C. Regeneration of cell wall in somatic hybridisation is induced by PEG.

D. Plants obtained through pollen culture  
are always haploids.

**Answer: C**



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**120.** A transgenic food crop which may help in solving the problem of night blindness in developing countries is:

A. Golden rice

B. Bt Soyabean

C. Starlink maize

D. Flavr Savr tomatoes

**Answer: A**



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**121.** Main objective of production/ use of herbicide resistant GM crop is to:

A. encourage eco-friendly herbicides

B. eliminate weeds from the field without the use of herbicides

C. reduce herbicide accumulation in food articles for health safety

D. eliminate weeds from the field without use of manual labour

**Answer: D**



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**122.** Human insulin is being commercially produced from a transgenic species of:

- A. Rhizobium
- B. Escherichia
- C. Saccharomyces
- D. Mycobacterium

**Answer: B**



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**123.** What is antisense technology ?

A. RNA polymerase producing DNA

B. Production of somaclonal variants in tissue cultures

C. A cell displaying a foreign antigen used for synthesis of antigens

D. When a piece of RNA that is complementary in sequence is used to stop expression of a specific gene

**Answer: D**



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**124.** The process of RNA interference has been used in the development of plant resistant to:

A. Nematodes

B. Fungi

C. Viruses

D. Insects

**Answer: A**



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**125.** Maximum number of existing transgenic animals is of:

A. Fish

B. Mice

C. Cow

D. Pig

**Answer: B**



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**126.** Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin 'A' deficiency ?

A. Canolla

B. Golden rice

C. Bt-Brinjal

D. Flava Savr' tomato

**Answer: B**



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**127.** Which of the following Bt crop is being grown in India by the farmers?

A. Cotton

B. Brinjal

C. Soyabean

D. Maize

**Answer: A**



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**128.** An analysis of chromosomal DNA using the southern hybridization technique does not use :

A. Electrophoresis

B. Blotting

C. Autoradiography

D. PCR

**Answer: D**



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**129.** The first human hormone produced by recombinant DNA technology is:

A. Insulin

B. Estrogen



C. Thyroxin

D. Progesterone

**Answer: A**



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**130.** Golden first is a genetically modified plant where the incorporated gene is meant for biosynthesis of:

A. Vit. C

B. Vit. A

C. Vit. B

D. Vit. D

**Answer: B**



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**131.** Name the gene that encode Bt toxin.



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**132.** Which organisms are mostly killed by Bt toxin.



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**133.** Expand GMO.



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**134.** On what type of interaction, ELISA is based ?



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**135.** Name the crop that contains expresses a transgene.



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**136.** What are transgenic bacteria ? Illustrate using any one example.



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**137.** Compare and contrast the advantages and disadvantages of production of genetically modified crop.



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**138.** What are Cry proteins ? Name an organism that produce it. How has a man exploited this protein to his benefit ?



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**139.** What is gene therapy ? Illustrate using the example of adenosine deaminase (ADA) deficiency ?



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**140.** Diagrammatically represent the experimental steps in cloning and expressing an human gene (say the gene for growth hormone) into a bacterium like E.coli ?



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**141.** Can you suggest a method to remove oil (hydrocarbon) from seeds based on your understanding of rDNA technology and chemistry of oil ?



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**142.** What is golden rice?



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**143.** Does our blood have proteases and nucleases ?



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