



BIOLOGY

BOTANY AND ZOOLOGY FOR NEET AND AIIMS

BIOTECHNOLOGY AND ITS APPLICATIONS

Exercise | Introduction

1. The critical research area of biotechnology are

- A. Providing the best catalyst
- B. Creating optiman conditions for a

catalyst to act

C. Down streaming processing

technologies to purify the protein or

organic compound

D. All

Answer: D



2. Plants, bacteria, fungi and animals whose genes have been altered by mani-pulation are called

- A. Genetically modified organisms
- B. Physically modified organisms
- C. Physiologically modified organisms
- D. Both (2) & (3)





3. Identify the correct statement in relation to genetically modified organisms

A. Only animals genes have been altered by

manipulation

B. Only plants genes have been altered by

anipulation

C. Only bacteria genes have been altered

by manipulation

D. Plants, bacteria, animals and fungi genes

have been altered by manipulation

Answer: D

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Exercise I Application In Agriculture

1. Genetic modification has

A. Made crops more tolerant to abiotic

stresses

B. reduced reliance on chemical pesticides

C. helped to reduce post harvest losses

D. All of the above

Answer: D

2. Which of the following is not true for genetically modified plants

A. Increased reliance on chemical pesticides

B. Helped to reduce post harvest losses

C. Enhanced nutritional value of food

D. Made crops more tolerent to abiotic

stresses

Answer: A



3. Genetically modified plants provide alternative resources to industries in the form of

A. Starches

B. Fuels

C. Pharmacenticals

D. All

Answer: D





4. Father of green revolution is

A. Paul Berg

B. Muller

C. Morgan

D. Norman Borlaug

Answer: D

1. Bt toxin is produced by a bacterium called

A. Actinomyces

B. Streptomyces

C. Bacillus thuringiensis

D. All of the these

Answer: C

2. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because

- A. Bacteria are resistant to the toxin
- B. Toxin is immature
- C. Toxin is inactive
- D. Bacteria enclose the toxin in special sac

Answer: C

3. Strains of Bacillus thuringiensis (Bt) are used in producing

A. Bioinsecticidal plants

B. Biomineralisation

C. Biometallurgical techniques

D. Biofertilizers

Answer: A

4. A protoxin is

A. A primitive toxin

B. A denatured toxin

C. Toxin produced by protozoa

D. Inactive toxin

Answer: D

5. 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



6. Bt Cotton is not

A. A GM plant

B. Insect resistant

C. A bacterial gene expressing system

D. Resistant to all pesticides.

Answer: D



7. 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.







8. Bt toxin is produced by

A. Bacillus mycoides

B. Bacillus thuringiensis

C. Bacillus licheniformis

D. Bacillus polymya

Answer: B

9. Bacteria used as biopesticide is

A. NPV

B. CPV

C. Bacillus thuringiensis

D. Both (1) and (2)

Answer: C

10. Which of the following chemical substances produced by Bacillus thuringiensis to kill insects

- A. Starch grains
- B. Oil droplets
- C. Hormones
- D. Protein crystals

Answer: D



11. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because

- A. Bacteria are resistant to the toxin
- B. Toxin is very active
- C. Toxin is inactive
- D. Bacteria encloses toxin in a special sac

Answer: C

12. Identify the insect resistance crop devleoped through genetic engineering technique

A. Himigiri variety wheat

B. Pusa sem 2 flat bean

C. Pusa komal variety of cowpea

D. BT cotton

Answer: D

13. The proteins encoded by the genes cryiAb and cryllAb controls respectively

A. Corn borer and Cotton boll worm

B. Cotton borer and Corn borer

C. Cotton boll worm and Bhendi fruit borer

D. Bhendi fruit borer and Cotton boll worm

Answer: A

14. Cry protein is obtained from

A. Protozoan

B. Bacteria

C. Fungi

D. Algae

Answer: B



Exercise I Pest Resistant Plants

1. Which of the following nematodes infects the roots of tobacco plants and causes a great reduction in yield?

A. Truffles

B. Meloidegyne iocognitia

C. Penicillium

D. Rhizopus

Answer: B

2. Silencing of a gene could be achieved through the use of

A. Short interfering RNA (RNAi)

B. Antisense RNA

C. Both (1) and (2)

D. None of the above

Answer: C

3. By using which of the following vectors, nematode-specific genes were introduced into the host plant

A. Agrobacterium tumefaciens

B. Meloidegyne incognitia

C. Escherichia coli

D. Bacillus thuringiensis

Answer: A

4. Mobile genetic elements are

A. RNA genomes

B. transposons

C. DNA genomes

D. mRNA

Answer: B

5. Which of the following methods involves silencing of a specific mRNA due to a complementary dsRNA molecule that binds to and prevents translation of the mRNA (silencing)

- A. RNA interference
- B. Gene therapy
- C. ELISA
- D. PCR

Answer: A



6. In RNAi, genes are silenced using

A. ss DNA

B. dsDNA

C. dsRNA

D. ssRNA

Answer: C



7. Meloidegyne incognitia is a

A. Nematode

B. Flat worn

C. Bacteria

D. Virus

Answer: A

8. Meloidegyne incognitia causes a great reduction in yield of

A. Bean

B. Tobacco

C. Rice

D. Cotton

Answer: B

9. A parasitic nematode that causes a great

reduction in yield of tobacco crop is

A. Claviceps purpurea

B. Puccinia graminis

C. Meloidegyne incognitia

D. Mycosphaerella berkeylli

Answer: C

10. Transposons are known as

A. Jumping genes

B. Mobile genetic elements

C. Non mobile genetic elements

D. Both (1) and (2)

Answer: D

11. Which of the following is a true for RNA i

A. Controlling translation

B. Controlling of transcription

C. Capping of hn RNA

D. Tailing of hn RNA

Answer: A

12. RNAi is also known as

A. Splicing of RNA

B. Reverse transcription

C. Teminism

D. Silencing of RNA

Answer: D

13. Which part of the tobacco plant is infected

by Meloidegyne incognitia?

A. Flower

B. Stem

C. Root

D. Leaves

Answer: C
14. The transgenic tobacco plant is resistant to

nematode meloidegyne due to presence of

A. Sense RNA and Antisense DNAs

B. Both Sense and Antisense DNAs

C. Both sense and Antisense RNAs

D. Both sense and Antisense DNAs

Answer: C

1. 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



2. Insulin consists of two short polypeptide chains: chain A and chain B, that are linked together by

A. hydrogen bonds

B. disulphide bridges

C. DNA ligase

D. DNA polymerase

Answer: B



3. In mammals including humans, insulin is synthesized as a pro-hormone, which contains an extra stretch called.

- A. A peptide
- B. B peptide
- C. C peptide
- D. D peptide

Answer: C

4. In which of the following years and companies prepared two DNA sequences corresponding to A and B chains of human insulin and introduced them in plasmids of E.coli to produce insulin chains

A. 1981, Eli Lilly

B. 1982, Eli Lilly

C. 1983, Eli Lilly

D. 1984, Eli Lilly

Answer: C

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5. Human insulin is obtained from genetically engineered

A. E. Coli

B. Pseudomonas sp

C. Clostridium sp

D. Corynebacterium sp

Answer: A

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6. Number of recombinant therapeutics have been approved for human use throughout the world is

A. 12

B. 30

C. 300

D. 21

Answer: B



7. Number of recombinant therapeutics

marketed in India at present

A. 30

B. 12

C. 20

D. 40

Answer: B



8. Insulin used for diabetes was earlier extracted from

A. Liver of slaughtered cattle and pigs

B. Lungs of slaughtered cattle and pigs

C. Pancreas of slaughtered cattle and pigs

D. Pancreas of mice cattle and pigs

Answer: C



9. Mature Insulin consists of

A. Two long polypeptides chains

B. Two long polynucleotide chains

C. Two short polypeptide chains

D. Two short polynucleotide chains

Answer: C

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10. Disulphide bonds in proinsulin link

A. A and C chain

B. B and C chain

C. A and B chain

D. A. B and C chain

Answer: C



11. Proinsulin synthesized in human is composed of

A. A, B and C peptides

B. peptide only

C. A & B peptides only.

D. B and C peptides





12. Which of the following bacterium is used to produce human insulin chains

A. Esherichia coli

B. Bacillus theringiensis

C. Bacillus licheniformis

D. Lacto bacillus





13. Which American company prepared two DNA sequences to humulin

A. Eli lilly

B. Venta

C. Zentic

D. EFB





14. The application of biotechnology for production of products of human use is called

A. Genomics

B. Proteomics

C. Molecular farming

D. Down streaming





Exercise I Gene Therapy

1. The site for production of ADA in the body is

A. Bone morrow

B. Lymphocytes

C. Blood plasma

D. Monocytes

Answer: B

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2. The first clinical gene therapy was done for treatment fo

A. AIDS

B. Cancer

C. Cystic fibrosis

D. SCID

Answer: D

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

A. Adenosine deoxyaminase

B. Adenosine deaminase

- C. Aspartat deaminase
- D. Arginine deaminase

Answer: B



4. The first clinical gene therapy was given in

1990 to a four year lod girl with deficiency of

A. Protein

B. adenosine deaminase

C. nutrition

D. mineral

Answer: B



5. Correction genetic defect involves delivery of a gene into the individual or embryo to take over the function of and compensate for the gene A. functional : healthy

B. defective : functional

C. normal : non-fuctional

D. non-functional : normal

Answer: C

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6. The technique of using gene technology in medicine where by an abnormal or faulty as non functional gene is replaced by a normal or

working gene so that the body can synthesize

the correct enzyme or protein and eliminated

the root cause of the disease is called

A. Chemotherapy

B. Biotherapy

C. Physiothcrapy

D. Gene thearpy

Answer: D

7. Which of the following genetic disorder in some children can be cured by bone marrow transplantation?

A. GDA deficiency

B. TDA dificiency

C. ADA deficiency

D. UDA deficiency

Answer: C

8. ADA deficiency can be cured by

A. Bone marrow transplantation

B. Enzyme replacement therapy

C. Kidney transplantation

D. Both (1) and (2)

Answer: D

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Exercise I Molecular Diagnosis

1. Which of the following techniques is based on the principles of antigen-antibody interaction?

A. ELISA

B. PCR

C. serum analysis

D. Urine analysis

Answer: A

2. A single-strandard DNA or RNA, tagged with a radioactive molecule (probe) is allowed A single-strandard DNA or RNA, tagged with a radioactive molecule (probe) is allowed to clone of cells followed by detection using clone of cells followed by detection using

A. Photographic film

- B. autoradiography
- C. amplification
- D. PCR

Answer: B



3. Archaeologists unearthed a human skull with a small dried fragment of the scalp still attached. They extracted a tiny amount of DNA from the scalp tissue. How could they obtain sufficient DNA for an analysis of the ancient man's genes?

A. Use a molecular probe

B. Subjecting DNA to electrophoresis

C. Use the polymerase chain reaction

D. Subjecting DNA to restriction enzymes

Answer: C

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4. Forensic scientists have to work often with extremely small samples of DNA obtained from the hair or other sources of suspected criminals. However, it is possible to produce

DNA 'fingerprint from these small samples by

using

A. gene gun

B. gene cloning

C. polymerase chain reaction

D. genetically engineered microorganisms

Answer: C

5. Which of the following techniques are not

used for early diagnosis of a disease

A. Serum and urine analysis

B. r.DNA technology

C. PCR method

D. ELISA

Answer: A

6. Diagnosis of HIV is normally done by

A. PCR

- **B.** Southern Blot
- C. ELISA
- D. Autora diography

Answer: C



Exercise I Transgenic Plant

1. Flavr-Savr is the genetically engineered

A. Potato

B. tomato

C. brinjal

D. rose

Answer: B



2. Plant biologists have developed an antisense gene that retards ripening in tomatoes, greatly extending the shelf life of the fruit. What might such a gene code for

A. A gene for a hormone that slows fruit ripening

B. A complementary mRNA that would pair with and block the translation of mRNA for the fruit ripening enzyme C. A gene for a transcription factor that
would block the transcription of the
fruit-ripening gene
D. A mutated version of the ripening gene
that would not promote ripening

Answer: B

3. Which of the following crops till now has

been genetically modified?

A. Tobacco

B. Tomato

C. Cotton

D. All of these

Answer: D

4. The slow ripening transgenic tomato was

developed in USA by using

A. antisense RNA technology

B. ribozyme technology

C. co-suppression approach

D. ELISA

Answer: A
5. Taipei is a variety of this crop plant

A. Wheat

B. Maize

C. Cotton

D. Rice

Answer: D



6. Golden rice variety is produced by

A. Introducing three genes for the production of vitamin 'A' in taipei variety **Biotechnology and Its Applications** B. Introducing three genes for the production of vitamin 'B' in taipei variety C. Introducing three genes for the production of vitamin 'C' in taipei variety D. Introducing threee genes for the

production of vitamin 'D' in taipei variety

Answer: A

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Exercise I Transgenic Animals

1. $\alpha - 1$ Antitrypsin is

A. An antacid

B. An enzyme

C. Used to treat arthritis

D. Used to treat emphysema

Answer: D

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2. The first transgenic cow developed in 1997

was

A. Dolly

B. Rosie

C. Ruby

D. Lily

Answer: B

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3. The GM cow named Rosie produced milk enriched with human protein

A. Alpha lactalbumin

- B. Beta lactalbumin
- C. Gamma lactalbumin
- D. All

Answer: A

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4. The transgenic cow named Rosie produced milk enriched with human protein alpha lactalbumin of about

A. 1.4g/litre

B. 2.4 g/litre

C. 4.2 g/litre

D. 4.1 g/litre

Answer: B

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5.95% of transgenic animals are

A. pigs

B. mice

C. rabbits

D. rats

Answer: B

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6. Identify the incorrect statement

A. Most of the industrialised nations are

rich financially but poor in Biodiversity

B. Most of the industrialised nations are rich financially but poor in Traditional knowledge C. Developing and under developed countries rich in biodiversity traditional knowledge D. Most of the industrialised nations are rich both financially and biodiversity and traditional knowledge

Answer: D

Exercise I Ethical Issues

1. Which of the following organizations has been set up by the Indian government to make decisions regarding the validity of GM research and the safety of introducing GM organisms for public services?

A. GAEC

B. AEGC

C. GEAC

D. EGAC

Answer: C



2. Biopiracy is related to which of the following?

A. Traditional knowledge

B. Biomoleculesandregardingbioresources,genesisolatedfrombioresources----C. Bioresources----D. All of the above----

Answer: D

3. Which of the following succeeded in tripling the food supply but yet was not enough to feed the growing human population

A. Biopiracy

B. GMO

C. Green revolution

D. Gene therapy

Answer: C

4. The second amendment of the Indian patents Bill made by the Indian parliament includes issues related to

A. Patent terms emergency provisions

B. Research and development intiatives

C. Cryopreservation

D. Both (1) and (2)

Answer: D

5. The use of bio-resources by multinational companies and other organisations without proper anthorisation from the countries and people concerned without compensatory payment called

- A. Biopiracy
- B. Biodiversity
- C. Biopatent
- D. Biotechnology

Answer: A



6. The estimated number of rice varieties in

India

A. 2000

B. 20000

C. 200

D. 200000

Answer: D





7. The number of basmati varieties of rice grown in India are

A. 27

B.37

C. 47

D. 57

Answer: A



8. Basmati variety of rice distinct for its unique

A. Colour and Size

B. Colour and Texture

C. Texture and Size

D. Aroma and Flavour

Answer: D

9. GEAC stands for

A. Genetic	Engineering	Authority
Committee		
B. Genetic	Engineering	Analysing
Committee		
C. Genetic	Engineering	Approval
Committee		

D. Genetic Engineering Action Committee

Answer: C



10. GEAC is mainly responsible for

A. Making decisions regarding validity of

GM research

B. Making decissions regarding safety of introducing GM organisms for public

services

C. Making decissions of appointment of

scientists

D. Both (1) and (2)

Answer: D

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11. Which variety of rice have reference in ancient texts, folklore and poetry, as it as been grown for centuries

A. Taipie

B. Japanica

C. IR-8

D. Basmati

Answer: D



12. Which variety of rice, American company

got patent rights through the US patent and Trade mark of Rice?

A. Basmati

B. Jaya

C. Padma

D. Taipei

Answer: A

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13. Indian traditional herbal medicines are

A. Neem

B. Turmeric

C. Mango

D. (1) and (2)

Answer: D





- 1. The examples of transgenic plants are
- (a) Lerma Roja (b) Flavr-Savr tomato
- (c) Sharbati sonora (d) Bt cotton

A. a, b & c are correct

B. a & b are correct

C. b & d are correct

D. a & c are correct

Answer: C

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2. Which of the following are correct?

a) PCRs are defined as the organisms, which

carry foreign genes

b) SCID is a group of rare genetic disorders

c) Cloning is the production of GMOs, eg, Flavr-savr tomato

d) The bacteria use restriction endonucleases

to destroy the DNA of invading foreign viruses

A. a, b & c are correct

B. a & b are correct

C. b & d are correct

D. a & c are correct

Answer: C





3. Which one of the following is a transgenic product useful for the treatment of hemophilia?

A. Factor VIII

B. Antithrombin II

C. α - 1-antitrypsin

D. Lysostaphin





4. Eli Lilly, an American company, prepared two DNA sequences corresponding to A and B chains of human insulin and introduced them in the plasmids of E.coli to produce insulin chains. Chains A and B were produced separately, extracted, and combined by creating

- A. peptide bonds
- B. ionic bonds

C. H-bonds

D. disulfide bonds

Answer: D



5. Identify the figure given below.



A. Glyphosphatase

B. Insulin

C. TPA

D. Erythropoietin

Answer: B

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6. The below diagram show a diagrammatic sketch of maturation of insulin. Select the

correct set of the names labelled A, B, C and D.



A. A-A-peptide, B-B-peptide, C-Proinsul in, D-

Free C-Peptide

B. A-Proinsulin, B-A-peptide, C-B-peptide, D-

free C-Peptide



peptide, D-Proinsulin

D. A-A-peptide, B-B-peptide, C-Free C -

peptide, D-Proinsulin

Answer: B

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7. Thie first clinical gene therapy includes introduction of gene into _____which codes for the enzyme



B. normal lymphocytes, adenyl cyclase

C. non functional lymphocytes, adenyl

cyclase

D. 1 and 3

Answer: A

8. Which of the following could be a permanent cure for the treatment of severe combined immunodeficiency (SCID)?

A. Bone marrow transplantation

B. Enzyme replacement therapy

C. both (1) and (2)

D. Gene therapy

Answer: D

9. Which of the following techniques serve the

purpose of early diagnosis ?

(A) Recombinant DNA technology

(B) PCR (C) ELISA

A. A only

B. A and C only

C. A and B only

D. all of these

Answer: D

10. Which step proved to be the main challenging obstacle in the production of human insulin by genetic engineering ?

A. Removal of C-peptide from active insulinB. Getting insulin assembled into a mature form

C. Addition of C-peptide to pro-insulin

D. Splitting A and B polypeptide chains
Answer: B



11. Why are repeated transfusions of genetically engineered cells required in SCID patients ?

A. The transfused cells have limited lifespan.

B. The introduced gene is mutated

C. The enzyme required is degraded after

20 days of transfusion

D. both (2) and (3)

Answer: A

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12. A doctor while ocprating on an HIV positivepatient accidentally cut himself with a scalpel.He comes to you, suspecting himself to have

contracted the virus. Which test will you advise him to rule out/confirm his suspision?

A. PCR

B. Routine urine examination

C. TLC

D. DLC

Answer: A



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 g/L

B. Has human a-lactalbumin

C. More balanced diet than normal cow

milk for babies

D. Was produced for the first time in 2001

Answer: D



- **14.** Transgenic animals are produced for which of the following purposes? I) To study the normal physiology and development.
- II) To study diseases.
- III) To obtain useful biological products.
- IV) To test the vaccine safety.
- V) To test the chemical safety.
- Which of the above statements are correct?

A. I, II and III

B. II, III and IV

C. I, II, III and V

D. I, II, III, IV and V

Answer: D

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15. Full up the blanks.

I) Human protein ...A... is used to treat emphysema.

II) In 1997, the first transgenic cow,

...B...produced human protein enriched milk.

III) Transgenic mice are developed to test the safety of vaccines before being used on humans, for example ...C......

IV) Government of India formed the organisations like ...D... to decide the validity and safety of GM organisms for public safety.Here A to D can be

A. A-Insulin, B-Dolly, C-BCG vaccine, D-

Rccombinant DNA Society

B. A- eta -1-antitrypsin, B-Rosie, C-AIDS vaccine,		
D-Genome E	ngineering	Action
Committee		
C. A- $lpha$ -1-antitrypsin, B-Rosie, C-Polio vaccine,		
D-Genetic En	gineering	Approval
Commitee		
D. A-Cry IAC, B-Do	olly, C-Influen	za virus
vaccine, D-Gene	Environmen	t Action
Committee.		

Answer: C



- **16.** Rosie' cow known to produce a type of milk which has all the following characteristics
- I) protein content of 2.4 mg/L.
- II) huinan a-lactalbumin.
- III) more nutritionally balanced for human

babies than natural cow milk.

Which of the above statements are correct?

A. I and II

B. I and III

C. II and III

D. I, II and III

Answer: C



17. Today, transgenic models have been developed for many human diseases, which includes

- I) rheumatoid arthritis
- II) Alzheimer's disease

III) cancer IV) cystic fibrosis

Choose the correct options.

A. I and II

B. II and IV

C. I, II and IV

D. I, II, III and IV

Answer: D

18. Consider the following statements about 'Rosie'

I) Rosie is a first transgenic cow.

II) Rosie produced human protein enriched milk.

III) The milk contained the human a lactalbumin and scientist behind the research believes that the milk from the cow could provide an alternative to huan breast milk. Which of the statements given above are correct? A. I & II

B. I & III

C. || & |||

D. I, II & III

Answer: D



19. Which of the following organizations has been set up by the Indian government to make decisions regarding the validity of GM

research and the safety of introducing GM

organisms for public services?

A. GAEC

B. AEGC

C. GEAC

D. EGAC

Answer: C

20. Mutation in CFTR genc causes

A. Burkitt lymphoma

B. PKU

C. cystic fibrosis

D. Albinism

Answer: C

21. α -1 antitrypsin is used to treat

A. cancer

B. cystic fibrosis

C. mal nutrition in babies

D. emphysema

Answer: D

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

- A. A.R. Bounting
- B. Eli Lily
- C. Charles Weissmann
- D. A. Tiselius

Answer: C

23. 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 coud be from mobile genetic elements

(transposons)

D. Ti plasmid with nematode - specific

genes has been used in RNAi

Answer: B

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24. Transgenic Brassica napus has been used

for the synthesis of

A. Hirudin

B. Heparin

C. Polygalacturonase

D. Cry protein

Answer: A

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25. Which is incorrect with respect to GM food

?

A. It contains the protein produced by the

transgene in question

B. GM food contains antibiotic resistance

gene itself

C. The enzyme produced by antibiotic

resistance gene will not cause allergies.

D. The bacteria in gut of humans could take

by antibiotic resistance gene.

Answer: C

26. Golden rice - a transgenic variety of rice - is

principally richer than normal rice in

A. Cry I Ab

B. Hirudin

C. TPA

D. β -carotene

Answer: D

27. In case of Bacillus thuringiensis, Bacillus itself is not killed by toxic protein crystals produced by it because

- A. Bt toxin protein is not produced in Bacillus
- B. Bt toxin protein is produced in very less

amount in Bacillus

- C. Bt toxin exists as inactive toxin
- D. Bt toxin cannot cause any damage to

Bacillus

Answer: C



28. Which of the following is the critical research area of biotechnology?

A. Providing best catalyst in the form of

improved organism only

B. Creating optimal conditions through

engineering for a catalyst to act only

C. Downstream processing technologies to

purify products only

D. All the above

Answer: D

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29. 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 biopesticide

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

30. Which of the following objective is not associated with application of agrobiotechnology A. Enhancement of nutritional quality B. Development of resistance against abiotic stresses C. Increased efficiency of mineral usage by

plants

D. Development of humulin like hormone





31. Incorrect match of the following

A. Coleopterans - beetles

B. Lepidopterans - mosquitoes

C. Dipterans - flies

D. Lepidopterans - army worm

Answer: B



32. Mark the odd one with respect to the advantages of genetically modified plants:

A. production of food with better

nutritional value

B. decrease in post harvest losses

C. decreased dependence on fertilizers

D. decreased usage of minerals

Answer: D



33. Which Indian plants have either been patented or attempts have been made to patent them by the Western nations for their commercial use?

A. Basmati rice

B. Turmeric

C. Neem

D. All of these have been targeted

Answer: D

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34. Consider the following statements.

I) Bt toxin gene has been cloned from the bacteria.

II) Genetic engineering works only on animals and has not yet been successfully used on plants. III) Strains of Bacillus thuringiensis are used in

producing bioinsecticidal plants.

Which of the statements given above are correct?

A. I & II

B. I & III

C. || & |||

D. I, II & III

Answer: B

35. Consider the following statements.

 Specific Bt toxin genes have been isolated from Bacillus thuringiensis.

II) Bt toxin is coded by a gene named cry.

III) Bt toxin protein exists as inactive protoxins.

Which of the statements given above are correct?

A. I, II and III

B. I and II

C. I and III

D. II and III

Answer: B

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36. Which of the following is/are considered as

application(s) of biotechnology?

- I) Waste treatment
- II) Energy production
- III) Bioremediation
- IV) Processed food

V) Genetically modified crops for agriculture

VI) Diagnostics

VII) Therapeutics

Choose the correct option.

A. I, II, III, IV and V.

B. III, V, VI and VII

C. I, II, III, V and VII

D. All of these

Answer: D

37. Genetic modification has

I) reduced reliance on chemical pesticides.

II) reduced post-harvest losses.

III) increased efficiency of minerals used by the plants.

IV) enhanced nutritional value of the food.

Which of the statements given above are correct?

A. I, II, III and IV

B. I, II and III
C. II, III and IV

D. III and IV

Answer: A



38. Fill up the blanks.

I)...A... are plants, bacteria, fungi and animals

whose genes have been altered by manipulation.

II) ...B... forms protein crystals which contains a

toxic insecticidal protein.

III) By using ...C... vectors, nematode specific genes were introduced into the host plants which produced both sense and antisense RNA in the host cells.

IV) RNA interference (RNAi) technique has been devised to protect the plants from nematode is silenced by ...D... produce by the host plant.

Here A lo D can be identified as

A. A-Transgenic organism, B-Bacillus

thuringiensis, C-Soil bacterium, D-dsDNA.

B. A-Genetically,	engineered	organism, B-
Meloidegyne	incognit	a C -
Agrobacterium, D-ssDNA		
C. A-Genetically	modified o	rganism. B -
Bacillus thuringiensis, C-Agrobacterium,		
D-dsRNA		
D. A-Clone, B	-Manduca	sexta, C-
Agrobacterium, D-SSRNA		

Answer:

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39. The critical research areas of biotechnology are

I) providing best catalyst as improved
organism, usually a microbe or pure enzyme.
II) creating optimal conditions by engineering
for a catalyst to act.

III) down stream processing technologies,

IV) Multiple Ovulation Transfer Technology (MOET).

Which of the statements given above are correct?

A. I and II

B. I, II and III

C. II, III and IV

D. I, II, III and IV

Answer: B

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40. Which of the following ways are suitable

for increasing food production? I)

Agrochemical based agriculture.

II) Organic agriculture.

III) Genetically engineered crop-based

agriculture.

Choose the correct option.

A. I and II

B. I and III

C. II and III

D. I, II and III

Answer: D



41. The green revolution succeeded in increasing the yield of crops mainly due to the use of

- I) improved varieties of the crops
- II) agro-chemicals
- III) better management practices
- Choose the correct option.
 - A. I and II
 - B. I and III
 - C. II and III

D. I, II and III

Answer: C

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42. Fill up the blanks.

I) Genes of plants, bacteria, fungi and animals
have been changed by manipulations
therefore these organisms are called ...A...
II) The organisms in which foreign genes have
been introduced by genetic engineering are

called ...B... The foreign genes change the host cell genetically such genes are known as ...C... and the production of transgenic organism is called ...D.... III) Bt tobacco was first cultured to kill ...E... A to E in the above statements can be identified as A. A-genetically, modified organisin, Btransgenic organisms, C-transgenes, Dtransgenesis, E-Kornworm B. A-transgenic organisms, B-genetically modified organism, C-cry genes, D-

transgenics, E-Bollworm

C. A-GMOs, B-transgenic organisms, C-

transgenes, D-transgenetics, E-corn

borer

D. A-transgenic organisms, B-GMOs, C-cry

genes, D-transgenesis, E-armyworm

Answer: A

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43. Bt toxin gene have been expressed in plant

in order to provide resistance against

- I) Tobacco budworm and Armyworm
- II) Beetles
- **III)** Flies and Mosquitoes
- Choose the correct option.
 - A. I and II
 - B. I and III
 - C. II and III
 - D. I, II and III

Answer: D



- 44. Consider the following statements.
- I) Transgenic animals are more sensitive to the toxic substance than non-transgenic animals.
 II) Useful biological products can be produced by introducing the portion of DNA which codes for a particular product into transgenic
- animals
- III) Brazzein is a protein produced by a west

African plant, Pentadiplandra brazzeana which is approximately 2000 time as sweet as sugar. Which of the statements are given above are correct?

A. I, II and III

B. I and II

C. I and III

D. None of these

Answer: A



45. Fill up the blanks.

I) ...A... is distinct for its aroma and flavour and ...B... documented varieties are cultivated in India.

II) Besides basmati rice, now patent attempts are in progress for ...C... and ...D....

III) Rosie was produced in the year

A. A-Parmal rice, B-30, C-coriander, D-peepal,

E - 1996

B. A-Basmati rice, B-27, C-turmeric, D-nccm,

E-1997

C. A-Parmal rice, B-29, C-banyan, D-turmeric,

E-1998

D. A-Basmati rice, B-24, C-tulsi, D-neem, E-

1999

Answer: B

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46. The aiims and objectives, of Genetic
Engineering Approval Committee are
I) To permit the use of genetically modified
organisms and their product for commercial
applications.

II) To adopt the procedures for restriction,
production and application of GM organisms.
III) Approval to conduct large scale field trails
and release of transgenic crops in the
environment. Which of the statements are
given above are correct?

A. I and II

B. I and III

C. II and III

D. I, II and III

Answer: D



47. Which Indian plants have either been patented or attempts have been made to patent them by Western nations for their commercial use?

- I) Basmati rice II) Neem
- III) Turmic IV) Tulsi

A. I and II

B. I and III

C. I, II and III

D. I, II, III and IV

Answer: C

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48. Consider the following statements about the responsibility of GEAC (set-up by the Indian Government).

I) GEAC make decisions regarding the validity of the GM research.

II) It checks the safety of introducing GM organisms for the public services for their large scale use. Which of the statements given above is/are correct?

A. Only I

B. Only II

C. I and II

D. None of these

Answer: C



49. Which of the following statement (s) is/are

true?

 Biowar is the use of biological weapons against humans and/or their crops and animals. II) Bioethics is an unauthorised use of bio
resources and traditional knowledge related
to bioresources for commercial benefits.
III) Biopatent is the exploitation of bio
resources of other nations without proper
authorisation.

Choose the correct option.

A. Only II

B. Only I

C. I and II

D. I and III

Answer: B



50. Consider the following statements. I) Flavr savr is a genetically modified tomato, which remains fresh and retains its flavour much longer than the normal tomato due to blocking of synthesis of fruit softening enzyme polygalacturonase.

II) Recently, the US Government has patented the Indian 'basmati rice as Rice tec. III) Viruses, bacteria and some other harmful organisms can be used as bioweapons in biological warfare. Which of the statements given above are correct?

A. I & II

B. I & III

C. || & |||

D. I, II & III

Answer: D



51. Proteins encoded by the genes cry IAb, cry II Ab control respectively

A. Cotton boll worms. Corn borer

B. Corn borer, cotton boll worm

C. Armyworm, tobacco bud worm

D. cotton boll worm, army worm

Answer:

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52. Incorrect regarding RNAi in transgenic tobacco plant

A. Nematode specific genes are introduced into host plant B. The introduced DNA produces both sense and anti-sense RNA C. ds RNA initiates RNAi, there bv nematode specific m RNA is silenced D. Host plant generated dsRNA triggers

protection against nematode infection





53. RNAi is a method of cellular defence in

A. In majority of eukaryotes

- B. in all prokaryotes
- C. In G.M crops only
- D. In all eukaryotic organisms

Answer: D



54. Transgenic animals are useful in studying

A. vaccine safety

B. chemical safety

C. role of genes in disease

D. all the above

Answer: D

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55. Select out the correct match

A. Transgenic papaya - Resistant to

bacterial pathogen Pseudomonas

B. Transgenic tomato - Resistant to the

ring spot virus

C. Transgenic potato - Resistant to

Phytophthora

D. Transgenic cotton - Resistant to

nematodes





56. At present how many recombinant therapeutics have been approred for human use the world over

A. 12

B. 3

C. 30

D. 33

Answer: C



57. Consider the following statement about therapeutic drugs:

 Recombinant DNA technology is used for production of therapeutic drugs which are safe and effective.

II) It avoid unwanted immunological responsescommonly observed with similar productsisolated from non human sources.

III) About thirty recombinant therapeuticshave been approved for human use in India.Which of the following statements givenabove are correct?

A. I and II

B. I and III

C. II and III

D. I, II and III

Answer: A



58. Match the following columns

Column-I

Column-II

- A) Golden rice i) Armyworm
- C) RNAi

- B) Bt Toxin ii) Rich in vitamin A
 - iii) Cry protein

. .

D) Lepidopterans iv) Gene silencing



Answer: A



59. Transposons are

A. Fragments of RNAi', that silences specific

mRNA

- B. ds RNA that initiates 'RNAi'
- C. Mobile genetic elements that replicate

via an RNA intermediate

D. Selectable markers like

''' amp'''', '' tet^R ''' **etc**





60. Identify the statement which is not true for Bt. toxin?

A. It is the product of cry - gene of Bacillus

thuringienis

B. It is secreted I crystalline state called

protoxin

C. It creates pores in the midgut of insect

larvae

D. The toxin causes cell wall damage to

Bacillus thuringiensis

Answer: D

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61. The tumor-inducing capacity of Agrobacterium tumaefaciens is located in large extrachromo-somal plasmid called

A. Ti plasmid

B. Ri plasmid

C. Lambda phage

D. Plasmid PBR 322

Answer: A

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62. Cry gene, which synthesizes crystal protein,

is isolated from
- A. Bacillus thuringiensis.
- **B. Rhizobium**
- C. Bacillus polymyxa
- D. Clostridium

Answer: A

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63. PCR technique is used in

A. Production of transgenic microbes

B. Production of genetically modified food

C. Forensic investigation

D. DNA technique

Answer: C

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64. DNA probe is used for

A. DNA fingerprinting

B. Detection of pathogenic bacteria

C. Medical genetics to find whether a

person carries a particular gene or not

D. all of the above

Answer: D

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65. A genetically engineered microorgansim used successfully in the bioremediation of oil spills is a species of

- A. Pseudomonas
- B. Trichoderma
- C. Xanthomonas
- D. Bacillus

Answer: A

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66. Bruise resistant variety of tomato is the

result of

- A. Gene cloning
- B. Antisense RNA technology
- C. Breeding for antinutritional factor
- D. Mass selection

Answer: B

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67. Protein coded by which of the following

genes controls the corn borer?

A. Cry I Ac

B. Cry II Ab

C. Cry I Ab

D. Both (1) and (2)

Answer: C

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68. Which of the following can be consiedered

as an advantage modified organisms (GMO)?

- A. Tolerant to abiotic stress
- B. Reduced reliance on chemical pesticides
- C. Reduced post harvest loss
- D. All of these

Answer: D

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69. Which of the following is true w.r.t. manufacture of genetically engineered insulin? A. C-peptide must be removed during challenge for the production of insulin using DNA techniques B. Eli Lily company was the first one to produce Humulin on commercial scale C. Chain A and chain B of insulin are held together by disulphide linkages D. All of these

Answer: D

70. Which technique will you use in the early diagnosis of AIDS infection?

A. ELISA

B. PCR

C. Western blot

D. Southern blot

Answer: D

71. Use for 'Humulin' by an Indian company for marketing without notifying Eli Lily company of U.S.A. will be described as

A. Bio-war

B. Bio-ethics

C. Biopiracy

D. Biopatent

Answer: C

72. Which gene would you try to manipulate to provide protection to a plant against cotton bollworm infection?

A. Cry I Ab

B. Cry I Ac

C. Bam HI

D. Bt

Answer: B

73. Select the correct statement w.r.t. Golden

rice vareity of Oryza sativa

A. It was created by transforming rice with

psy and crt 1 genes

B. Golden rice was designed to produce β -

earotene in the endosperm part

C. It is rich in a-carotene, an active form of

vitamin A

D. It was created by Ingo Potrykus of the

Institute of Plant Sciences at the Swill

Federal Institute of Technology

Answer: B

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74. The protein encoded by the gene cry II Ab

controls

A. Corn borer

B. Cotton boll worms

C. Root knot disease of tobacco

D. Loose smut of wheat

Answer: B

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75. 'Flavr Savr' is an example of recombinant DNA technology being used to suppress the native genes of an organism. Which of the following statements is not true w.rt. Flavr

Savr?

A. It is a transgenic tomato variety

B. It has a relatively longer shelf life

C. Polygalacturonase enzyme synthesis is

suppressed

D. Some toxins are produced in the plant,

hence is not fit for human consumption

Answer: D

- 76. Transgenic animals are designed for
- a) study of factors like IGF
- b) testing the safety of polio vaccine
- c) biological products like alpha lactalbumin
- d) xenotransplantation (transgenic pigs)
- e) gene amplification

A. a, b, e

B. a, b, c, d

C. b, d, e

D. b, c, d, e

Answer: B

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77. Silencing of a gene could be achieved through the use of

A. Short interfering RNA (RNA)

B. Antisense RNA

C. By both

D. None of the above

Answer: C

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Exercise lii Previous Aipmt Neet Questions

1. The two polypeptides of human insulin are linked together by

A. Covalent bond

B. disulphide bridge

C. hydrogen bonds

D. phosphodiester bond

Answer: B

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2. hich part of the tobacco plant is infected by

Meloidogyne incognita?

A. Stem

B. Root

C. Flower

D. Leaf

Answer: B

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3. The cutting of DNA at specific locations became possible with the discovery of:

A. Ligases

B. Restriction enzymes

C. Probes

D. Selectable markers

Answer: B

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4. Which body of the Government of India regulates GM research and safely of introducing GM organisms for public services?

A. Research	Committee	on	Genetic
Manipulation			
B. Biosafety Committee			
C. Indian Council of Agricultural Research			
D. Genetic	Engineering	5	Approval
Committee			
Answer: D			
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5. In Bt cotton, the Bt toxin present in plant tissue as protoxin is converted into active toxin due to

A. Presence of conversion factors in insect

B. Alkaline pH of the insect gut

C. Acidic pH of the insect gut

D. Action of gut microorganisms

Answer: B

6. The crops engineered for glyphosate are resistant/tolerant to:

A. Herbicides

B. Fungi

C. Bacteria

D. Insects

Answer: A

7. The first human hormone produced by

recombinant DNA technology is :

A. Insulin

B. Estrogen

C. Thyroxin

D. Progesterone

Answer: A

8. Which of the following Bt crops is being grown in India by the farmers?

A. Maize

B. Cotton

C. Brinjal

D. Soybean

Answer: B

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

A. Golden rice

B. Bt-Brinjal

C. Flavr Savr Tomato

D. Canola

Answer: A

10. Continuous addition of sugars in 'fed batch

fermentation is done to:

A. Degrade sewage

B. Produce inethane

C. Obtain antibiotics

D. Purify enzymes

Answer: C

11. Maximum number of existing transgenic

animals is of:

A. Pig

B. Fish

C. Mice

D. Cow

Answer: C

12. The most common substance used in distilleries for the production of ethanol is:

A. Molasses

B. Corn meal

C. Soyabean

D. Ground gram

Answer: A

13. Some of the characteristics of Bt cotton are

A. Long fibre and resistance to aphids

B. Medium yield, long fibre and resistance

to beetle pests

C. High yield and production of toxic

protein crystals which kill dipteran pests

D. High yield and resistance to bollworms

Answer: D

14. The genetically modified (GM) brinjal in India has been developed for :

A. Insect-resistance

B. Enhancing shelf life

C. Enhancing mineral content

D. Drought-resistance

Answer: A

15. Genetic engineering has been successfully used for producing

A. Transgenic models for studying new treatments for certain cardiac diseases B. Transgenic cow Rosie which produces high fat milk for making ghee C. Animals like bulls for farm work as they have super power

D. Transgenic mice for testing safety of

polio vaccine before use in humans.

Answer: D

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16. Transgenic plants are

A. produced by a somatic embryo in

artificial medium



17. A transgneic food crop, which may help in solving the problem of nightblidness in developing countries is

- A. Flavr-Savr tomatoes
- B. starlink maize
- C. Bt soybean
- D. Golden rice

Answer: D
18. A genetically engineered microorganism used successfully in bioremediation of oil spills is a species of

A. Pseudomonas

B. Trichoderma

C. Xanthomonas

D. Bacillus

Answer: A

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19. Reagent used in ELISA test is

A. Endonuclease

B. Polymerase

C. Ligase

D. Peroxidase

Answer: D

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