BIOLOGY

BOOKS - AAKASH SERIES

BIOTECHNOLOGY AND ITS APPLICATIONS

Exercise I Introduction

1. The critical research areas 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

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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)

Answer: A

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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

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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

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

A. Starches

B. Fuels

C. Pharmacenticals

D. All

Answer: D

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4. Father of green revolution is

A. Paul Berg

B. Muller

C. Morgan

D. Norman Borlaug

Answer: D

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Exercise I B T Cotton

1. Bt toxin is produced by a bacterium called

A. Actinomyces

B. Streptomyces

C. Bacillus thuringiensis

D. All of the these

Answer: C

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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

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

A. Bioinsecticidal plants

B. Biomineralisation

C. Biometallurgical techniques

D. Biofertilizers

Answer: A

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4. 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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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

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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

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7. The trigger for activation of toxin of Bacillus thuringiensis is insects 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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8. Bt toxin is produced by

A. Bacillus mycoides

B. Bacillus thuringiensis

C. Bacillus licheniformis

D. Bacillus polymya

Answer: B

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9. Bacteria used as biopesticide is

A. NPV

B. CPV

C. Bacillus thuringiensis

D. Both (1) and (2)

Answer: C

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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

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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

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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

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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

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14. Cry protein is obtained from

A. Protozoan

B. Bacteria

C. Fungi

D. Algae

Answer: B

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Exercise I Pest Resistant Plants

1. Which of the following nematode infects the roots of tobacco plant and causes a great reduction in yield.

A. Truffles

B. Meloidegyne iocognitia

C. Penicillium

D. Rhizopus

Answer: B

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2. Silencing of a gene could b e 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

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3. Mark the option that fill in the blanks suitably :

Using _____ vectors, nematode-specific genes were introduced into the host plant for pest resistance.

A. Agrobacterium tumefaciens

B. Meloidegyne incognitia

C. Escherichia coli

D. Bacillus thuringiensis

Answer: A

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4. Mobile genetic elements are

A. RNA genomes

B. transposons

C. DNA genomes

D. mRNA

Answer: B


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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

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6. In RNAi genes are silenced using

A. ss DNA

B. dsDNA

C. dsRNA

D. ssRNA

Answer: C

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7. Meloidegyne incognitia is a

A. Nematode

B. Flat worn

C. Bacteria

D. Virus

Answer: A

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8. Meloidegyne incognitia causes a great reduction in yield of

A. Bean

B. Tobacco

C. Rice

D. Cotton

Answer: B

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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

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10. Which part of the tobacco plant is infected by Meloidogyne incognita

A. Flower

B. Stem

C. Root

D. Leaves

Answer: C

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11. 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

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Exercise I Biotechnology Applications In Medicine

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

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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

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3. In human insulin is synthesised as a prohormone, which contains an extra stretch called :-

A. A - peptide

B. B - peptide

C. C - peptide

D. D - peptide

Answer: C

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

A. 12

B. 30

C. 300

D. 21

Answer: B

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7. How many recombinant therapeutics are being marketed in India ?

A. 30

B. 12

C. 20

D. 40

Answer: B

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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

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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. In the structure of pro - insulin in humans disulphide bonds exist between

A. A and C chain

B. B and C chain

C. A and B chain

D. A. B and C chain

Answer: C

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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

Answer: A

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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

Answer: A

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13. Which American company prepared two DNA sequences to humulin

A. Eli lilly

B. Venta

C. Zentic

D. EFB

Answer: A

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

A. Genomics

B. Proteomics

C. Molecular farming

D. Down streaming

Answer: C

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Exercise I Gene Therapy

1. The site of 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 the treatment of

A. AIDS

B. Cancer

C. Cystic fibrosis

D. SCID

Answer: D

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

A. Adenosine deoxyaminase

B. Adenosine deaminase

C. Aspartat deaminase

D. Arginine deaminase

Answer: B

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4. Which enzyme was targetted during the first clinical gene therapy given in 1990 to a 4 year old girl?

A. Protein

B. adenosine deaminase

C. nutrition

D. mineral

Answer: B

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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

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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

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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

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

A. Photographic film

B. autoradiography

C. amplification

D. PCR

Answer: B

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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

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5. Which of the following technique is not used for early diagnosis of disease?

A. Serum and urine analysis

B. r.DNA technology

C. PCR method

D. ELISA

Answer: A

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6. Diagnosis of HIV is normally done by

A. PCR

B. Southern Blot

C. ELISA

D. Auto radiography

Answer: C

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Exercise I Transgenic Plant

1. Flavr Savr is genetically modified

A. Potato

B. tomato

C. brinjal

D. rose

Answer: B

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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

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3. Which of the following crops till now has been genetically modified?

A. Tobacco

B. Tomato

C. Cotton

D. All of these

Answer: D

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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

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5. Taipei is a variety of this crop plant

A. Wheat

B. Maize

C. Cotton

D. Rice

Answer: D

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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. More than 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

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Exercise I Ethical Issues

1. Which body will 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

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2. Biopiracy is related to which of the following?

A. Traditional knowledge

B. Biomolecules and regarding bioresources, genes isolated from bioresources

C. Bioresources

D. All of the above

Answer: D

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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

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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

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5. The use of bioresources by multinational companies and other organisations without proper authorisation from the countries and people concerced without compensatory payment is 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

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

A. 27

B. 37

C. 47

D. 57

Answer: A

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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

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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

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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

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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

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Exercise Ii

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

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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

Answer: A

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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

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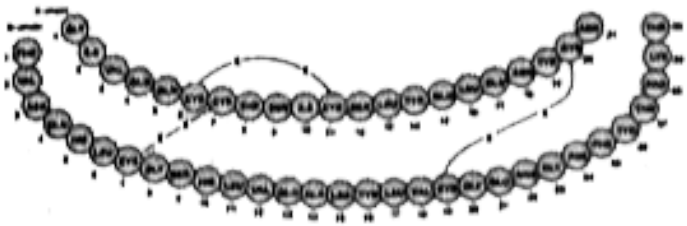
5. Identify the figure given below.



A. Glyphosphate

B. Insulin

C. TPA

D. Erythropoietin

Answer: B

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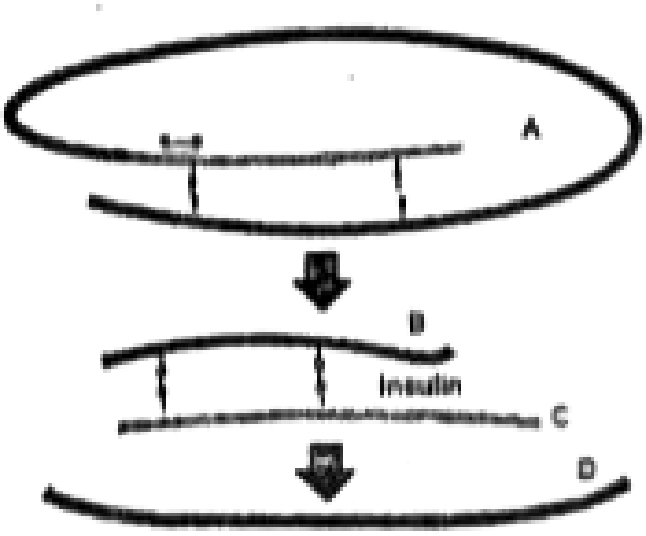
6. The below diagram show a diagrammatic sketch of maturation of insulin. Select the correct set of the names labelled A, B, C and D.



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

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

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

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

Answer: B

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

A. defective lymphocytes, ADA

B. normal lymphocytes, adenyl cyclase

C. non functional lymphocytes, adenyl cyclase

D. 1 and 3

Answer: A

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

A. Bone marrow transplantation

B. Enzyme replacement therapy

C. both (1) and (2)

D. Gene therapy

Answer: D

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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

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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 insulin

B. Getting insulin assembled into a mature form

C. Addition of C-peptide to pro-insulin

D. Splitting A and B polypeptide chains

Answer: B

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11. Why is 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 operating on an HIV (+)ve patient accidentally cuts himself with a scalpel. Suspecting himself to have contracted the

virus which test will he take to rule out/confirm his suspicion ?

A. PCR

B. Routine urine examination

C. TLC

D. DLC

Answer: A

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13. Rosie' a transgenic cow is known to produce a type of milk which has all the following charcteristics, 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

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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-β-1-antitrypsin, B-Rosie, C-AIDS vaccine, D-Genome Engineering Action Committee

C. A-α-1-antitrypsin, B-Rosie, C-Polio vaccine, D-Genetic Engineering Approval Commitee

D. A-Cry IAC, B-Dolly, C-Influenza virus vaccine, D-Gene Environment Action Committee.

Answer: C

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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) human 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

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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

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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. II & III

D. I, II & III

Answer: D

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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

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20. Mutation in CFTR genc causes

A. Burkitt lymphoma

B. PKU

C. cystic fibrosis

D. Albinism

Answer: C

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21. Protein α - 1 antitrypsin is used to treat

A. cancer

B. cystic fibrosis

C. mal nutrition in babies

D. emphysema

Answer: D

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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

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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

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

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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

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27. In the 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

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28. The critical research areas of biotechnology are

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 increase the amount of pesticide used

Answer: C

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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

Answer: D

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31. Select the incorrect match from the following .

A. Coleopterans - beetles

B. Lepidopterans - mosquitoes

C. Dipterans - flies

D. Lepidopterans - army worm

Answer: B

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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

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33. Which of the Indian plants have either been patented or attempts have made to patent them by 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. II & III

D. I, II & III

Answer: B

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35. Consider the following statements.

I) 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

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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

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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 incognita C - Agrobacterium, D-ssDNA

C. A-Genetically modified organism. 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

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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 cotton was first cultured to kill ...E... A to E in the above statements can be identified as

A. A-genetically, modified organisin, B-transgenic organisms, C-transgenes, D-transgenesis, E-Bollworm

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

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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

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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-neemm, 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

 Watch Video Solution

47. Which of the Indian plants have either been patented or attempts have made to

patent them by western nations for their commercial use?

A. I and II

B. I and III

C. I, II and III

D. I, II, III and IV

Answer: C

Watch Video Solution

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

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49. Which of the following is/are true?

I. Biowar is the use of biological weapons against humans and/or their crops and animals

II. Bioethics is the unauthorised use of

bioresources and traditional knowledge related to bioresources for commercial benefits

III. Biopatent is exploitation of bioresources of other nations without proper athorisation

A. Only II

B. Only I

C. I and II

D. I and III

Answer: B

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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. II & III

D. I, II & III

Answer: D

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51. Various proteins produced by cry IAb, cry II Ab genes to control insects 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 by nematode specific m RNA is silenced

D. Host plant generated dsRNA triggers protection against nematode infection

Answer: D

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53. RNAi is a method of cellular defence in

A. 1) In majority of eukaryotes

B. 2)in all prokaryotes

C. 3)In G.M crops only

D. 4)In all eukaryotic organisms

Answer: D

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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

Answer: C

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

A. 12

B. 3

C. 30

D. 33

Answer: C

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57. Consider the following statement about therapeutic drugs:

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

II) It avoid unwanted immunological responses commonly observed with similar products isolated from non human sources.

III) About thirty recombinant therapeutics have been approved for human use in India.

Which of the following statements given above are correct?

A. I and II

B. I and III

C. II and III

D. I, II and III

Answer: A

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58. Match the following columns

Column-I	Column-II
A) Golden rice	i) Armyworm
B) Bt Toxin	ii) Rich in vitamin A
C) RNAi	iii) Cry protein
D) Lepidopterans	iv) Gene silencing

A. 1) $\begin{matrix} A & B & C & D \\ II & III & IV & I \end{matrix}$

B. 2) $\begin{matrix} A & B & C & D \\ III & IV & I & II \end{matrix}$

C. 3) $\begin{matrix} A & B & C & D \\ IV & I & II & III \end{matrix}$

D. 4) $\begin{matrix} A & B & C & D \\ II & I & III & IV \end{matrix}$

Answer: A

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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 $'''\text{amp}''^{R}$, $''tet^{R}''$ etc

Answer: C

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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 tumefaciens is located in large extra-chromosomal plasmids 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 proteins, 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 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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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 cotton bollworms?

A. Cry I Ac

B. Cry II Ab

C. Cry I Ab

D. Both (1) and (2)

Answer: C

Watch Video Solution

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

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70. Which technique is not used in the diagnosis of AIDS infection?

A. ELISA

B. PCR

C. Western blot

D. Southern blot

Answer: D

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

A. Bio-war

B. Bio-ethics

C. Biopiracy

D. Biopatent

Answer: C

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

A. Cry I Ab

B. Cry I Ac

C. Bam HI

D. Bt

Answer: B

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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-carotene 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

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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 b e 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 Iii Previous Aipmt Neet Questions

1. The two polypeptides of human insuluin are linked together by:-

A. Covalent bond

B. disulphide bridge

C. hydrogen bonds

D. phosphodiester bond

Answer: B

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2. Which 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 safety 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 Approval Committee

Answer: D

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5. In Bt cotton, the Bt toxin present in plant tissue as pro-toxin 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

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

A. Herbicides

B. Fungi

C. Bacteria

D. Insects

Answer: A

 Watch Video Solution

7. The first human hormone produced by recombinant DNA technology is

A. Insulin

B. Estrogen

C. Thyroxin

D. Progesterone

Answer: A

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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

 Watch Video Solution

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

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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

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11. Maximum number of existing transgenic animals is of:

A. Pig

B. Fish

C. Mice

D. Cow

Answer: C

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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

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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

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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

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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 plants having

A. produced by a somatic embryo in artificial medium

B. generated by introducing foreign DNA into a cell and regenerating a plant from that cell.

C. produced after protoplast fusion in artificialmedium

D. grown in artificial medium after hybridization in the field

Answer: B

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17. A transgenic food crop, which may help in solving the problem of night blindness in developing countries is

A. Flavr-Savr tomatoes

B. starlink maize

C. Bt soybean

D. Golden rice

Answer: D

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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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