# **Biotechnology and its Applications**

# Question 1.

Which of the following is not a benefit of transgenic animals?

- (a) Investigation of new treatments for diseases
- (b) Early detection of diseases
- (c) Testing the safety of vaccines
- (d) To produce useful biological products

#### Answer:

(b) Early detection of diseases

# Question 2.

GEAC stands for

- (a) Genome Engineering Action Committee
- (b) Ground Environment Action Committee
- (c) Genetic Engineering Approval Committee
- (d) Genetic and Environment Approval Committee.

#### Answer:

(c) Genetic Engineering Approval Committee

#### Question 3.

a - 1 – antitrypsin is

- (a) an antacid
- (b) an enzyme
- (c) used to treat arthritis
- (d) used to treat emphysema.

# Answer:

(d) used to treat emphysema.

# Question 4.

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

- (a) a single stranded RNA
- (b) a single stranded DNA
- (c) either RNA or DNA
- (d) can be ssDNA but not ssRNA.

#### Answer:

(a) a single stranded RNA, (b) a single stranded DNA

# Question 5.

The site of production of ADA in the body is

- (a) erythrocytes
- (b) lymphocytes
- (c) blood plasma
- (d) osteocytes.

#### Answer:

(b) lymphocytes







# Question 6.

A protoxin is

- (a) a primitive toxin
- (b) a denatured toxin
- (c) toxin produced by protozoa
- (d) inactive toxin.

Answer:

(d) inactive toxin.

#### Question 7.

Pathophysiology is the

- (a) study of physiology of pathogen
- (b) study of normal physiology of host
- (c) study of altered physiology of host
- (d) none of the above

Answer:

(c) study of altered physiology of host

# Question 8.

The trigger for activation of toxin of Bacillus thuringiensis is

- (a) acidic pH of stomach
- (b) high temperature
- (c) alkaline pH of gut
- (d) mechanical action in the insect gut.

Answer:

(c) alkaline pH of gut

# Question 9.

Golden rice is

- (a) a variety of rice grown along the yellow river in China
- (b) long stored rice having yellow colour tint
- (c) a transgenic rice having gene for  $\beta$  -carotene
- (d) wild variety of rice with yellow coloured grains.

Answer:

(c) a transgenic rice having gene for  $\beta$  -carotene

#### Question 10.

In RNAi, genes are silenced using

- (a) ssDNA
- (b) dsDNA
- (c) dsRNA
- (d) ssRNA.

Answer:

(c) dsRNA

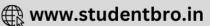
#### Question 11.

All are the biotechnological applications in order to increase food production except

- (a) apiculture
- (b) agro-chemical based agriculture
- (c) organic farming







(d) genetically engineered crop-based agriculture.

Answer:

(a) apiculture

#### Ouestion 12.

Agro-chemical based agriculture includes

- (a) fertilisers and pesticides
- (b) genetically modified crops
- (c) RNA interference
- (d) all of these.

Answer:

(a) fertilisers and pesticides

# Question 13.

'Golden rice' developed through transgene approach is enriched with

- (a) high lysine content
- (b) high methionine content
- (c) high glutenin content
- (d) high vitamin A content.

Answer:

(d) high vitamin A content.

# Question 14.

Goldlen rice is yellow in colour due to the presence of 15.

- (a) riboflavins
- (b) β carotene
- (c) vitamin B<sub>1</sub>
- (d) complex genetic material.

Answer:

(b) β - carotene

# Question 15.

First genetically modified plant commercially released injudia is

- (a) golden rice
- (b) FlavrSavr
- (c) Bt brinjal
- (d) Bt cotton.

Answer:

(d) Bt cotton.

# Question 16.

Which one of the following is not used as biofertiliser?

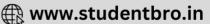
- (a) Bacillus thuringiensis
- (b) Anabaena
- (c) Nostoc
- (d) Rhizobium

Answer:

(a) Bacillus thuringiensis







# Question 17.

Which of the following agricultural challenges cannot be solved with transgenic techniques ?

- (a) Crops are damaged by frost or drought 17,
- (b) Crops are damaged by insect pests
- (c) Public concern about safety of synthetic pesticides
- (d) Public preference for organic vegetables

#### Answer:

(d) Public preference for organic vegetables

# Question 18.

Bt toxins are

- (a) intracellular lipids 18.
- (b) intracellular crystalline proteins
- (c) extracellular crystalline proteins
- (d) intracellular polysaccharides

#### Answer:

(b) intracellular crystalline proteins

# Question 19.

Bt toxin protein crystals present in bacterium Bacillus thuringiensis, do not kill the bacteria themselves because

- (a) bacteria are resistant to the toxin
- (b) toxins occur as inactive protoxins in bacteria
- (c) bacteria enclose toxins in a special sac
- (d) none of these.

#### Answer:

(b) toxins occur as inactive protoxins in bacteria

#### Question 20.

What causes the inactive form of Bt toxin i.e., protoxin to get converted into its active form in the body of an insect ?

- (a) Temperature of the gut
- (b) Enzymes present in the saliva
- (c) Alkaline pH of the gut
- (d) There is no specific reason.

# Answer:

(c) Alkaline pH of the gut

# Question 21.

The first clinical gene therapy was done for the treatment of

- (a) AIDS
- (b) cancer
- (c) cystic fibrosis
- (d) SCID (Severe Combined Immuno Deficiency resulting form deficiency of ADA).

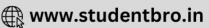
#### Answer:

(d) SCID (Severe Combined Immuno Deficiency resulting form deficiency of ADA).

#### Ouestion 22.

Silencing of a gene could be achieved through the use of





- (a) RNAi only
- (b) antisense RNA only
- (c) both RNAi and antisense RNA
- (d) none of the above.

(c) both RNAi and antisense RNA

#### Ouestion 23.

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

- (a) bioethics
- (b) biowar
- (c) biopatent
- (d) biopiracy.

Answer:

(a) bioethics

### Question 24.

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

- (a) Sharbati Sonora
- (b) Co-667
- (c) Basmati
- (d) LermaRojo

Answer:

(c) Basmati

# Question 25.

Which of the following has been covered under the broad patent category?

- (a) Triticum
- (b) Oryza
- (c) Pisum sativum
- (d) Brassica

Answer:

(b) Oryza

### Question 26.

Biopiracy means

- (a) use of bippatents
- (b) thefts of plants and animals
- (c) stealing of bioresources
- (d) exploitation of bioresources without authentic permission.

Answer:

(d) exploitation of bioresources without authentic permission.

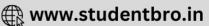
#### Question 27.

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

- (a) Biopiracy act
- (b) Indian Patents Bill







- (c) ETIact
- (d) Negotiable instruments act

(b) Indian Patents Bill

Question 28.

Potential pathogens for bioweapons are

- (a) Bacillus anthracis
- (b) Yerisinia pestis
- (c) Vibrio cholerae
- (d) all of these.

Answer:

(d) all of these.

Ouestion 29.

Bt cotton is not

- (a) a GM-plant
- (b) insect resistant
- (c) a bacterial gene expressing system
- (d) resistant to all pesticides.

Answer:

(d) resistant to all pesticides.

Question 30.

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 pro-insulin to insulin
- (d) responsible for its biological activity.

Answer:

(c) removed during maturation of pro-insulin to insulin

Question 31.

Which of the following genes were introduced in cotton to protect it from cotton bollworms?

- (a) Cry Ac and CryAb
- (b) BtAc and Btab
- (c) CrylAc and CryllAb
- (d) Nif genes

Answer:

(c) CrylAc and CryllAb

Question 32.

Cry 11 Ab and and crylAb produce toxins that control

- (a) cotton bollworms and corn borer respectively 23
- (b) corn borer and cotton bollworms respectively
- (c) tobacco budworms and nematodes respectively
- (d) nematodes and tobacco budworms respectively.

Answer:

(a) cotton bollworms and corn borer respectively 23





### Question 33.

Bt corn has been made resistant from corn borer 24. disease by introduction of the gene

- (a) crylAb
- (b) cryllAb
- (c) amp<sup>R</sup>
- (d) Trp.

Answer:

(a) crylAb

#### Ouestion 34.

The process of RNA interference has been used to make tobacco plant resistant to 25.

- (a) Bacillus thuringiensis
- (b) Meloidogyne incognita
- (c) flies and mosquitoes
- (d) Both (a) and (b).

Answer:

(b) Meloidogyne incognita

#### Question 35.

roots of tobacco plants?

- (a) Agrobactcrium tumefaciens
- (b) Rhizobium leguminosarum
- (c) Meloidogyne incognita
- (d) Taenia solium

Answer:

(c) Meloidogyne incognita

# Question 36.

RNA interference involves

- (a) synthesis of cDNA and RNA using reverse transcriptase
- (b) silencing of specific mRNA due to complementary RNA
- (c) interference of RNA in synthesis of DNA
- (d) synthesis of mRNA from DNA.

Answer:

(b) silencing of specific mRNA due to complementary RNA

# Question 37.

The transgenic plant 'Flavr Savr' tomato carries an artificial gene of

- (a) delayed ripening process
- (b) longer shelf life
- (c) enhanced flavour
- (d) all of these

Answer:

(d) all of these

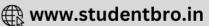
# Question 38.

'Flavr Savr' variety of tomato which remains fresh for a longer period than normal tomato variety

- (a) has high amount of enzyme polygalacturonase
- (b) has reduced amount of enzyme polygalacturonase







- (c) is a pest resistant variety
- (d) is rich in vitamin A and prevents night blindness. '

(b) has reduced amount of enzyme polygalacturonase

#### Question 39.

Nif gene for nitrogen fixation in cereal crops like wheat, jowar etc., is introduced by cloning

- (a) Rhizobium meliloti
- (b) Bacillus thuringiensis
- (c) Rhizopus stolonifer
- (d) Agrobacterium tumefaciens.

Answer:

(a) Rhizobium meliloti

#### Ouestion 40.

How many recombinant therapeutics worldwide have been approved for human use?

- (a) 13
- (b) 25
- (c) 30
- (d) 40

Answer:

(c) 30

#### Question 41.

How many recombinant therapeutics are being marketed in India?

- (a) 8
- (b) 12
- (c) 15
- (d) 30

Answer:

(b) 12

# Question 42.

During the processing of proinsulin into the mature insulin

- (a) C peptide is added to proinsulin
- (b) C peptide is removed from proinsulin
- (c) B peptide is added to proinsulin
- (d) B peptide is removed from proinsulin.

Answer:

(b) C – peptide is removed from proinsulin

# Question 43.

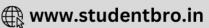
Which of the following companies started selling humulin in the year 1983?

- (a) EliLilly
- (b) Genetech
- (c) GEAC
- (d) None of these

Answer:

(a) EliLilly





#### Question 44.

Human insulin is being commercially produced from a transgenic species of

- (a) Mycobacterium
- (b) Rhizobium
- (c) Saccharomyces
- (d) Escherichia.

### Answer:

(d) Escherichia.

#### Question 45.

A genetic disorder can be cured through

- (a) rDNA technology
- (b) embryo transfer
- (c) gene therapy
- (d) all of these.

#### Answer:

(c) gene therapy

# Question 46.

Gene therapy can be referred to as

- (a) pre-clinical testing for inherited diseases in newborns
- (b) treatment of diseases caused by genetic defect
- (c) genetic engineering using rDNA technology
- (d) cancer treatment using in vitro cultured stem cells.

#### Answer:

(b) treatment of diseases caused by genetic defect

# Question 47.

What might be an advantage of beginning gene therapy prior to birth?

- (a) This would give the body plenty of time to utilise the new genes.
- (b) The body would not reject it as it has not yet recognised 'self.
- (c) The cells being extremely young, are more receptive of gene therapy.
- (d) There probably is not any advantage.

#### Answer:

(b) The body would not reject it as it has not yet recognised 'self.

### Question 48.

Early detection of a disease is possible by

- (a) PCR
- (b) gene therapy
- (c) recombinant DNA technology and ELISA
- (d) Both (a) and (c).

# Answer:

(d) Both (a) and (c).

#### Question 49.

It is a single stranded DNA or RNA, tagged with a radioactive molecule and is used to detect mutated genes.

- (a) RNAi
- (b) Probe







- (c) Plasmid
- (d) Primer Technique used to detect the DNA in a clone is

(b) Probe

Question 50.

- (a) polymerase chain reaction
- (b) gel electrophoresis
- (c) chromatography
- (d) autoradiography.

Answer:

(d) autoradiography.

Question 51.

Molecular probes are used for many genetic disorders like

- (a) Duchenne muscular dystrophy
- (b) cystic fibrosis
- (c) Tay-Sachs disease
- (d) All of these.

Answer:

(d) All of these.

Question 52.

Second generation vaccines are prepared by recombinant DNA technology. Which out of the following are the examples of such vaccines ?

- (a) Hepatitis B virus vaccine
- (b) Herpes virus vaccine
- (c) Salk's polio vaccine
- (d) Both (a) and (b)

Answer:

(d) Both (a) and (b)

Question 53.

Animals that have had their DNA manipulated to possess and express a foreign gene are called

- (a) transgenic animals
- (b) somatic hybrids
- (c) somaclones
- (d) super animals.

Answer:

(a) transgenic animals

Question 54.

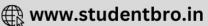
95% of the existing transgenic animals are

- (a) fish
- (b) pigs
- (c) sheep
- (d) mice.

Answer:

(d) mice.





# Question 55.

The transgenic animals are those which have

- (a) foreign RNA in all its cells
- (b) foreign DNA in some of its cells
- (c) foreign DNA in all its cells
- (d) both (a) and (c).

Answer:

(c) foreign DNA in all its cells

# Question 56.

Giant mouse has been produced through

- (a) gene transfer
- (b) gene differentiation
- (c) tissue culture
- (d) all of these.

Answer:

(a) gene transfer

### Question 57.

What is ANDI?

- (a) Transgenic cow
- (b) Transgenic dog
- (c) Transgenic sheep
- (d) Transgenic monkey

Answer:

(d) Transgenic monkey

# Question 58.

Given are names of some transgenic animals. Identify the name of transgenic sheep.

- (a) Rosie
- (b) Dogie
- (c) Tracy
- (d) ANDI

Answer:

(c) Tracy

### Question 59.

Which of the following is not a genetically modified organism (GMO)?

- (a) Golden rice
- (b) Rosie
- (c) Dogie
- (d) Dolly

Answer:

(d) Dolly

# Question 60.

A Human protein which is being obtained from transgenic animals and is used to treat emphysema is

- (a) alpha-lactalbumin
- (b) thyroxine







- (c) a 1 antitrypsin
- (d) insulin.

(c) a-1-antitrypsin

