



BIOLOGY

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BIOTECHNOLOGY AND MICROBES IN HUMAN WELFARE

Beginners Box 1

1. Transfer of any gene into a completely different organism can be done through

A. Genetic engineering

B. Tissue culture

C. Transformation

D. RNA interference

Answer: A



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2. DNA probe is used in

A. Gel electrophoresis

B. Northern blotting

C. DNA finger printing

D. Interferon synthesis

Answer: C



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3. First artificial gene synthesized by khorana was a gene of

- A. Arginine
- B. Lysine
- C. Alanine t-RNA of yeast
- D. Valine t-RNA

Answer: C



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4. PBR 322 is an artificial gene vector which does not have

- A. Amphotericin marker gene
- B. Cos site
- C. Restriction site for *cl*a I enzyme
- D. Ori

Answer: B



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5. The thermostable enzyme , "Taq" and "Pfu", is isolated from thermophilic bacteria are :

- A. RNA polymerase
- B. DNA primers
- C. DNA polymerases
- D. DNA ligase

Answer: C



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Beginners Box 2

1. Bt toxin kills the insect by

- A. Blocking the nerve conduction
- B. Damaging the surface of trachea
- C. By creating pores in the tracheal system
- D. By creating pores in the mid gut

Answer: D



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2. Which is not an application of modern biotechnology ?

- A. Production of hymulin

B. Developing a DNA vaccine

C. Gene therapy

D. Production of cheese and butter

Answer: D



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3. Transgenic Brassica napus has been used for the synthesis of:

A. Hirudin

B. Heparin

C. Polgalacturonase

D. Cry protein

Answer: A



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4. Transgenic tobacco plant was developed by the process of RNA interference, was resistant against the infection of

A. Algae *Scenedesmus*

B. Fungi *Fusarium*

C. Bacteria : *Bacillus thuringiensis*

D. Nematode : *Meloidogyne incognita*

Answer: D



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5. The first clinical gene therapy was given for treating :

- A. Rheumatoid arthritis
- B. Adenosine deaminase deficiency
- C. Diabetes
- D. Chicken pox

Answer: B



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Exercise I

1. *Agrobacterium tumefaciens* used in Genetic engineering for

- A. DNA-mapping
- B. DNA-modification
- C. Gene transfer
- D. DNA finger printing

Answer: C



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2. Biologically functional gene coding for tyrosine t-RNA of E.coil synthesized by Khorana in 1979 had:

- A. 333 nucleotide pairs
- B. 312 nucleotide pairs
- C. 77 nucleotide pairs
- D. 207 nucleotide pairs

Answer: D



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3. Who isolated the first restriction endonucleases :

A. Temin & Baltimore

B. Sanger

C. Smith

D. Paul berg

Answer: C



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4. Genetic engineering is

A. Study of extra nuclear gene

B. Manipulation of gene by artificial method

C. Manipulation of RNA

D. Manipulation of enzymes

Answer: B



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5. Polymerase chain reaction technology (PCR - technique) is used for

- A. DNA identification
- B. DNA repair
- C. DNA amplification
- D. Cleave DNA

Answer: C



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6. Which structure involved in genetic engineering

A. Plastid

B. Plasmid

C. Codon

D. None

Answer: B



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7. Which of the following is the example of chemical scissors

A. Eco -RI

B. Hind - III

C. Bam -I

D. All the above

Answer: D



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8. Restriction enzymes are used in genetic engineering because they

- A. They can degrade harmful proteins
- B. They can join DNA fragments
- C. They can cut DNA at variable site
- D. They can cut DNA at specific base sequences

Answer: D



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9. When the genotype of an organism is improved by the addition of foreign gene, the process is called

- A. Tissue culture
- B. Genetic diversity

C. Genetic engineering

D. Plastic surgery

Answer: C



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10. A genetically manipulated organism containing in its genome one or more inserted gene of another species is called

A. Transposon

B. Gene expression

C. Transgenic organism

D. Retroposons

Answer: C



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11. Which vector is commonly used in the transfer of gene in a crop plant

- A. Plasmids of B. Subtilis
- B. Bacteriophages
- C. T0-plasmids of Agrobacterium
- D. E. coli Phages

Answer: C



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12. The tumour inducing capacity of *Agrobacterium tumefaciens* is located in large extrachromosomal plasmid and called

A. Ti -plasmid

B. Ri-plasmid

C. Lambda phage

D. Plasmid P^{BR322}

Answer: A

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13. Chimeric DNA is

- A. DNA which contains uracil
- B. DNA synthesized from RNA
- C. Recombinant DNA
- D. DNA which contains single strand

Answer: C

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14. Genetic engineering aims at:

- A. Destroying wild gene
- B. Preserving defective gene
- C. Curing human disease by introducing new gene
- D. All the above

Answer: C



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15. A piece of nucleic acid using to find out a gene, by forming hybrid with it, is called as

- A. $c - DNA$
- B. DNA probe

C. Sticky end

D. Blunt end

Answer: B



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16. Taq-polymerase which is used for amplification of DNA related with

A. Hybridoma technique

B. PCR -technique

C. Gene cloning

D. r-DNA technology

Answer: B



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17. Plasmid has been used as vector because

- A. It is circular DNA which have capacity to join to eukaryotic DNA
- B. It can move between prokaryotic and eukaryotic cells
- C. Both ends show replication
- D. It has antibiotic resistance gene

Answer: A



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18. What is true of plasmid

- A. Plasmids are widely used in gene transger
- B. These are found in virus
- C. Plasmid contains gene for vital activities
- D. These are main part of chromosome

Answer: A



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19. Which of the following cuts the DNA from specific places :

A. Restriction endonucleases

B. Ligase

C. Exonuclease

D. Alkaline phosphate

Answer: A



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20. Manipulation of DNA in genetic engineering became possible due to the discovery of

A. Restriction endonucleases

B. DNA ligase

C. Transcriptase

D. Primase

Answer: A



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21. Which one of the following bacteria has found extensive use in genetic engineering work in plants?

A. *Bacillus coagulans*

B. *Agrobacterium tumefaciens*

C. Clostridium septicum

D. Xanthomonas citri

Answer: B



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22. Restriction enzymes

A. Are endonucleases which cleave DNA at specific sites

B. Make DNA complementary to an existing DNA or RNA

C. Cut or join DNA fragments

D. Are required in vectorless direct gene transfer

Answer: A



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23. Restriction endonucleases

A. Are synthesized by bacteria as part of their defense mechanism

B. Are present in mammalian cells for degradation of DNA when the cell dies

C. Are used in genetic engineering for ligating two DNA molecules

D. Are used for invitro DNA synthesis

Answer: A



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24. The Ti plasmid, is often used for making transgenic plants. This plasmid is found in

- A. Yeast as a 2μ plasmid
- B. Azotobacter
- C. Rhizobium of the roots of leguminous plants
- D. Agrobacterium

Answer: D



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25. Which of the following is the example of direct gene transfer:

- A. Microinjection
- B. Electroporation
- C. Particle gun
- D. All the above

Answer: D



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26. How many copies of DNA sample are produced in PCR technique after 6-cycle

A. 4

B. 32

C. 64

D. 16

Answer: C



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27. Thermal cycle takes place in which technique

A. Gel electrophoresis

B. PCR -technique

C. Centrifugation

D. Southern blotting

Answer: B



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28. In r-DNA technique which of the following technique is not used in introducing DNA into host cell

A. Transduction

B. Conjugation

C. Transformation

D. Electroporation

Answer: B



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29. PCR-technique is used in

A. Production of transgenic microbe

B. Production of genetically modified food

C. Forensic investigation

D. r-DNA technology

Answer: C



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30. BACs and YACs are:

- A. Natural DNA obtained from bacteria and yeast
- B. Useful vectors for eucaryotic gene transger
- C. Artifical DNA obtained from bacteria and yeast
- D. 2 & 3 both

Answer: D



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31. Restriction enzymes are

- A. Not always required in genetic engineering
- B. Essential tool in genetic engineering
- C. Nucleases that cleave DNA at specific sites
- D. 2 & 3 both

Answer: D



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32. Function of restriction endonuclease enzyme is

- A. Useful in genetic engineering

B. Protects the bacterial DNA against foreign DNA

C. Helpful in transcription

D. Helpful in protein synthesis

Answer: B



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33. Electroporation procedure involves:

A. Fast passage of food through sieve pores in phloem elements with the help of electric stimulation

B. Opening of stomatal pores during night by artificial light

C. Making transient pores in the cell membrane to introduce gene constructs

D. Purification of saline water with the help of a membrane system

Answer: C



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34. Which is not correct matched

A. Agrobacterium \Rightarrow Ti-plasmid

B. Cosmid \Rightarrow Vector DNA

C. Rhizobium \Rightarrow Asymbiotic N_2 fixer

D. Albinism \Rightarrow Autosomal recessive gene

Answer: C



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35. In transgenics, the expression of transgene in the target tissue is known by

A. Reporter

B. Enhancer

C. Transgene

D. Promotor

Answer: D



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36. Which of the following restriction endonuclease enzyme produce blunt end in DNA :

A. Bam HI ↓
 G G A T C C
 C C T A G G

B. ECORI ↓
 G A A T T C
 C T T A A G

C. Hae-III ↓
 G G C C
 C C G G

D. All the above

Answer: C



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37. A bacterium modifies its DNA by adding methyl groups to the DNA, It does so to

- A. Clone its DNA
- B. Be able to transcribe many genes simultaneously
- C. Turn its gene on
- D. Protect its DNA from its own restriction enzyme

Answer: D



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38. The restriction enzyme **ECO RI** has the property of

- A. endonuclease activity
- B. exonuclease activity
- C. ligation activity
- D. correcting the topology of replicating DNA

Answer: A



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39. DNA ligase is an enzyme that catalyses the

A. splitting of DNA threads into small bits

B. joining of the fragments of DNA

C. denaturation of DNA

D. synthesis of DNA

Answer: B



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40. *Agrobacterium tumefaciens* contains a larger plasmid, which induces tumour in the plants it is termed as

A. Ti plasmid

B. Ri plasmid

C. Recombinant plasmid

D. Shine Delgrano sequence

Answer: A



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41. More advancement in genetic engineering is due to

A. Restriction endonucleases

B. Reverse transcriptase

C. Protease

D. Zymase

Answer: A



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42. The function of polymerase chain reaction (PCR) is

- A. translation
- B. transcription
- C. DNA amplification
- D. None of these

Answer: C



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43. Which of the following is used as a best genetic vector in plants

- A. *Bacillus thuringiensis*
- B. *Agrobacterium tumefaciens*
- C. *Pseudomonas putida*
- D. All of these

Answer: B



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44. Which of the following enzyme is used to join DNA fragments :

A. Terminase

B. Endonuclease

C. Ligase

D. DNA polymerase

Answer: C



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45. A kind of Biotechnology involving manipulation of DNA is

A. DNA replication

B. Genetic engineering

C. Denaturation

D. Renaturation

Answer: B



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46. What is true of plasmid

A. Found in viruses

B. Contains genes for vital activities

C. Part of nuclear chromosome

D. Widely used in gene transfer

Answer: D



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47. A suitable vector for gene cloning in higher organism is

- A. Baculovirus
- B. Retrovirus
- C. *Salmonella typhimurium*
- D. *Neurospora crassa*

Answer: B



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48. PCR proceeds in three distinct steps governed by temperature they are in order of :

A. Denaturation, Annealing, Synthesis

B. Synthesis, Annealing, Denaturation

C. Annealing, Synthesis, Denaturation

D. Denaturation, Synthesis, Annealing

Answer: A



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49. What is the source of the Ti (Tumor inducing) plasmid which is modified and used as a cloning vector to deliver the desirable genes into plant cells?

- A. *Agrobacterium tumefaciens*
- B. *Thermophilus aquaticus*
- C. *Pyrococcus furiosus*
- D. *Aedes aegypti*

Answer: A



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50. The thermostable enzyme , "Taq" and "Pfu", is isolated from thermophilic bacteria are :

- A. RNA polymerase
- B. DNA polymerases
- C. Restriction endonucleases
- D. DNA ligase

Answer: B



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51. The term "molecular scissors" generally refers to

- A. DNA polymerases
- B. RNA polymerases
- C. Restriction endonucleases
- D. DNA ligase

Answer: C



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52. In the PCR technology the DNA segment is replicated over a billion times. This repeated replications catalyzed by the enzyme

- A. DNA polymerases

B. Taq polymerase

C. DNA dependent RNA polymerase

D. Primase

Answer: B



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53. The restriction enzyme(s) used in recombinant DNA technology that make staggered cuts in DNA leaving sticky ends is //are

A. Eco RI

B. Hind III

C. BamHI

D. All of the above

Answer: D



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54. Cohen and Boyer isolated an antibiotic resistance gene, by cutting out a piece of DNA from a plasmid which was responsible for conferring antibiotic resistance, in the year

A. 1962

B. 1965

C. 1972

D. 1982

Answer: C



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55. Restriction enzyme Eco RI cuts the DNA between bases G and A only when the sequence in DNA is

A. GATATC

B. GAATTC

C. GATTCC

D. GAACTT

Answer: B



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56. Transgenic plants are developed by

- A. Inducing gene mutation
- B. Arresting spindle fibre formation
- C. Deleting sex chromosomes
- D. Introducing foreign genes

Answer: D



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57. The microinjection of desired gene from other organism into fertilized eggs of animals results in?

- A. monstrosities
- B. free Martins
- C. transgenic animals
- D. twins

Answer: C



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58. For a DNA to function as a cloning vector the most essential requirement is

- A. multiple restriction sites
- B. several selectable markers
- C. circular nature
- D. ori' sequence

Answer: D



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59. According to EFB, "The integration of natural science and organism, cells, parts thereof and molecular analogues for products and services," is known as-

A. Biochemistry

B. Bioinformatics

C. Biotechnology

D. Biology

Answer: C



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60. The stickiness of DNA ends facilitates the action of which enzyme

A. DNA polymerases

B. DNA ligase

C. Restriction endonucleases

D. Alkaline phosphate

Answer: B



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61. Which technique is used to check the progression of restriction enzyme digestion

A. PCR

B. Gel electrophoresis

C. Southern Blotting

D. Staining

Answer: B



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62. In gel electrophoresis, at which end of the gel the sample is loaded ?

- A. In the wells
- B. Towards positive electrode
- C. Towards negative electrode
- D. 1 & 3 both

Answer: A



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63. An antibiotic resistance gene of plasmid vector which get inactivated due to insertion of alien DNA, helps in the selection of

- A. Transformants
- B. Recombinants
- C. Non-Transformants
- D. 2 & 3 both

Answer: B



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64. In which type of bioreaction air bubbles dramatically increases the oxygen transfer area ?

- A. Simple stirred tank bioreactor
- B. Sparged stirred tank bioreactor
- C. Both 1 & 2
- D. None of these

Answer: B



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65. Genetic modification (GM) has been used to

- A. Create tailor made plants

B. Supply alternative resources to industries

C. Enhanced nutritional value of food

D. All of the above

Answer: D



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66. The choice of Bt-gene for experiment depends upon

A. The host plant/crop

B. Targeted pest/insect

C. Bacillus strain

D. 1 & 2 both

Answer: D



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67. In nematode resistance by RNA interference, some specific genes were introduced which form dsRNA. These were introduced in

- A. Nematode
- B. Host plant
- C. Agrobacterium
- D. All of these

Answer: B

68. Select the incorrect match

- A. Transgenic mice-Polio vaccine
- B. Rosie cow- α lactalbumin gene
- C. ssDNA/RNA probe- Gene therapy
- D. PCR - Molecular diagnosis

Answer: C

69. Which of the following step is not involved in basic steps in genetically modifying an organism

- A. Identification of DNA with desirable gene
- B. Introduction of the identified DNA into the host
- C. Amplification of DNA by using PCR
- D. Maintenance of introduced DNA in the host and transfer of the DNA to its progeny

Answer: C



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70. In EcoRI, R is stand for

- A. Strain
- B. Species
- C. Genus
- D. Order

Answer: A



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71. Restriction endonucleases are used in genetic engineering to form

- A. Recombinant molecule of protein
- B. Recombinant molecule of DNA
- C. Recombinant molecule of protein & DNA
- D. Recombinant cell

Answer: B



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72. Which instrument is used for the separation of DNA fragments

- A. PCR
- B. Gel electrophoresis

C. Bioreactor

D. Restriction endonucleases

Answer: B



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73. Which of following feature is not necessary for cloning vector

A. Origin of replication

B. High copy number

C. Selectable marker

D. Cloning sites

Answer: B



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74. Which of the following is not true for cloning vector

- A. more than two origin site of replication
- B. vector should have selectable marker gene
- C. single recognition site for the commonly used restriction enzyme
- D. pBR-322 have tetracycline resistance

Answer: A



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75. Transformation is a procedure through which

- A. A piece of DNA is introduced in a host bacterium
- B. A piece of DNA is introduced in a vector
- C. A piece of DNA is introduced from protein
- D. All

Answer: A



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76. Find out the correct sequence of PCR

A. (i) Annealing (ii) Denaturation (iii) Extension

B. (i) Denaturation (ii) Extension (iii) Annealing

C. (i) Denaturation (ii) Annealing (iii) Extension

D. (i) Extension (ii) Denaturation (iii) Annealing

Answer: C



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77. Second letter of the name of restriction endonuclease came from the

A. Genus of organism

B. Species of organism

C. Family of organism

D. Class of organism

Answer: B



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78. To isolate DNA from fungi we have to break the wall.

This is done by

A. Lysozyme

B. Cellulose

C. Invertase

D. Chitinase

Answer: D



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79. Which of the following enzyme will get inactivated in insertional inactivation

A. Transacetylase

B. Permease

C. β – galactosidase

D. Taq-polymerase

Answer: C



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80. In presence of chromogenic substrate recombinant bacteria gives

- A. Red coloured colonies
- B. Colourless colonies
- C. Blue colonies
- D. Green colonies

Answer: B



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81. Which of the following enzyme is know as molecular secissors

- A. Ligase
- B. DNA polymerases
- C. Restriction enzyme
- D. Helicase

Answer: C



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82. Which of the following is not required in PCR-

- A. DNA primer
- B. DNA template
- C. RNA primer
- D. Taq polymerase

Answer: C



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83. The substrate for restriction enzyme is-

- A. Single stranded RNA
- B. Proteins
- C. Double stranded DNA

D. Single stranded DNA

Answer: C



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84. In recombinant DNA technology, the term vector refers to

A. the enzyme that cuts DNA into restriction fragments

B. the sticky end of a DNA fragment

C. a plasmid used to transfer DNA into a living cell

D. a DNA probe used to identify a particular gene

Answer: C



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85. pBR-322 which is frequently used as a vector for cloning gene is

- A. an original bacterial plasmid
- B. a modified bacterial plasmid
- C. a viral genome
- D. a transposon

Answer: B



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86. Genetically engineered bacteria have been used in commercial production of

A. Thyroxin

B. Testosterone

C. Human insulin

D. Melatonium

Answer: C



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87. Important objective of biotechnology in agriculture section is

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

Answer: A



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88. The number of drug used in cancer treatment produced by biotechnology is

A. Interferon

B. [HGH] Human growth hormone

C. TSH

D. Insulin

Answer: A



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89. The prerequisites for biotechnological production of antibiotics is

A. To search an antibiotic producing
microorganism

- B. To isolate the antibiotic gene
- C. To join antibiotic gene with E.coli plasmid
- D. All of the above

Answer: D



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90. Modern biotechnology consist:

- A. Genetic engineering
- B. Tissue culture
- C. Microbiology
- D. All the above

Answer: D



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91. First artificial synthesysed hormone is:

A. Secretin

B. Insulin

C. Glucagen

D. Renin

Answer: B



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92. Transgenic animal has

- A. Foreign DNA is all its cells
- B. Foreign RNA is all its cells
- C. Foreign DNA is some of the cells
- D. Both 2 and 3

Answer: A



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93. Find the odd one out:

- A. vaccines - immunology

B. eco degradation - pesticides

C. solar energy converter - pest control

D. recombinant DNA - biotechnology

Answer: C



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94. The protein products of the following Bt toxin genes cryIAc and cryIIAb are responsible for controlling:

A. Bolloworm

B. Roundworm

C. Moth

D. Fruit fly

Answer: A



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95. A transgenic rice (Gloden rice) has been developed for increased content of:

A. Vitamin A

B. Vitamin B_1

C. Vitamin C

D. Vitamin D

Answer: A



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96. During the processing of the prohormone "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



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97. A genetically engineered bacteria used for clearing oil spills is:

- A. *Escherichia coli*
- B. *Bacillus subtilis*
- C. *Agrobacterium tumefaciens*
- D. *Pseudomonas putida*

Answer: D



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98. Use of transgenic plants as biological factories for the production of special chemical is called

- A. Molecular farming
- B. Molecular genetics
- C. Molecular mapping
- D. Dry farming

Answer: A



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99. First transgenic plant:

A. Potato

B. Tomato

C. Tobacco

D. Maize

Answer: C



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100. E. coli are used in production of:

A. Rifampicin

B. LH

C. Ecodyson

D. Interferon

Answer: D



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101. A 'giant mouse' in the laboratory can be produced by gene:

- A. Gene mutation
- B. Gene synthesis
- C. Gene manipulation
- D. Gene replication

Answer: C



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102. 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 batter 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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103. The bacteria *Pseudomonas* is useful because of its ability to:

- A. Transfer gene from one plant to another
- B. Decompose a variety of organic compounds
- C. Fix atmospheric nitrogen in the soil
- D. Produce a wide variety of antibiotics

Answer: B



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104. Cry-gene which synthesize crystal protein isolated from:

- A. *Bacillus thuriengensis*
- B. *Rhizobium*
- C. *Bacillus polymyxa*
- D. *Clostridium*

Answer: A



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105. Which of the following risks are associated with genetically modified foods ?

A. Toxicity

B. Allergic reaction

C. Antibiotic resistance in microorganism present in
alimentary canal

D. All the above

Answer: D



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106. Gene therapy first used in the treatment of

A. Albinism

B. Haemophilia

C. SCID

D. LIQID

Answer: C



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107. DNA probe is used for

A. DNA finger printing

B. Detection of pathogenic bacteria

C. Medical genetics to find whether a person carries
a particular gene or not

D. All the above

Answer: D



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

A. Bioinsecticidal plants

B. Bio-mineralization processes

C. Biofertilizers

D. Bio-metallurgical techniques

Answer: A



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109. Bt-cotton is resistant for

A. Round-worm

B. Fluke-worm

C. Boll-worm

D. Pin-worm

Answer: C



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110. Genetically engineered human insulin is called

- A. Humulin
- B. Haematin
- C. Hybridoma
- D. Hybrid

Answer: A



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111. The C-peptide is

- A. not present in proinsulin
- B. present in mature insulin
- C. removed during maturation of insulin
- D. also present in artificial insulin

Answer: C



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112. GEAC makes decisions regarding

- A. the validity of GM research

B. the safety of introducing GM organisms for public services

C. the validity of biopatents

D. more than one options are correct

Answer: D



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113. The use of bio-resources by multinational companies & other organisations without proper authorisation from the countries & people concerned, is known as-

A. Biopatent

B. Biopiracy

C. Biowar

D. Biodiversity

Answer: B



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114. Why has the Indian parliament cleared the second amendment of the country's patents bill?

A. 1st

B. 2nd

C. 3rd

D. 4th

Answer: B



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115. Which of the following peptide chain is not present in mature insulin

A. A-peptide

B. B-peptide

C. C-peptide

D. A & B peptide

Answer: C



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Exercise II

1. Two microbes found to be very useful in genetic engineering are

- A. *Escherichia coli* and *Agrobacterium tumefaciens*
- B. *Vibrio cholerae* and a tailed bacteriophage
- C. *Diplococcus* sp. and *Pseudomonas* sp.
- D. Crown gall bacterium and *Caenorhabditis elegans*

Answer: A



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2. Restriction endonuclease-

- A. Cuts the DNA molecule randomly
- B. Cuts the DNA molecule at specific sites
- C. Restricts the synthesis of DNA inside the nucleus
- D. Synthesizes DNA

Answer: B



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3. Golden rice is a promising transgenic crop. When released for cultivation , it will help in:

- A. Alleviation of vitamin A deficiency
- B. Pest resistance
- C. Herbicide tolerance
- D. Producing a petrol-like from rice

Answer: A



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4. Genetically engineered microorganism used successfully in bioremediation of oil spills is:

A. Pseudomonas

B. Trichoderma

C. Xanthomonas

D. Bacillus

Answer: A



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5. Cry 1 endotoxins obtained from Bacillus Thuringiensis are effective against

A. Flies

B. Nematodes

C. Boll worms

D. Mosquitoes

Answer: C



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6. Human insulin is being commercially produced from a transgenic species of

A. Mycobacterium

B. Rhizobium

C. Saccharomyces

D. Escherichia

Answer: D



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7. Main objective of production of herbicide resistant GM crops is to

- A. Eliminate weeds from the field without the use of herbicides
- B. Encourage eco-friendly herbicides
- C. Reduce herbicide accumulation in food articles for health safety

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

Answer: D



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

A. Starlink maize

B. Bt Soybean

C. Golden rice

D. Flavr Savr tomatoes

Answer: C



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9. Which one of the following is commonly used in transfer of foreign DNA into crop plants ?

- A. *Penicillium expansum*
- B. *Trichoderma harzianum*
- C. *Medoidogyne incognita*
- D. *Agrobacterium tumefaciens*

Answer: D



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10. Polyethylene glycol method is used for

- A. Energy production from sewage
- B. Gene transfer without a vector
- C. Biodiesel production
- D. Seedless fruit production

Answer: B



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11. Transgenic plants are the ones:

- A. Grow in artificial medium after hybridization in the field
- B. Produced by a somatic embryo in artificial medium
- C. Generated by introducing foreign DNA into a cell and regenerating a plant from the cell
- D. Produced after protoplast fusion in artificial medium

Answer: C



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12. The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as

- A. Source of industrial enzyme
- B. Indicator of water pollution
- C. Insecticide
- D. Agent for production of dairy products

Answer: C



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13. What is true about Bt toxin ?

- A. The concerned Bacillus has antitoxins
- B. The inactive protoxin gets converted into active form in the insect gut
- C. Bt protein exists as active toxin in the Bacillus
- D. The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication

Answer: B



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14. The genetic defect-adenosine deaminase (ADA) deficiency may be cured permanently by

- A. Enzyme replacement therapy
- B. Periodic infusion of genetically engineered lymphocytes having functional ADA cDNA
- C. Administering adenosine deaminase activators
- D. Introducing bone marrow cells producing ADA into cells at early embryonic stage

Answer: D



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15. Which one of the following is used as vector for cloning genes into higher organisms ?

- A. Rhizopus nigricans
- B. Retrovirus
- C. Baculovirus
- D. Salmonella typhimurium

Answer: B



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16. Restriction endonucleases are enzymes which:

- A. restrict the action of the enzyme DNA polymerase
- B. remove nucleotides from the ends of the DNA molecule

C. make cuts at specific positions within the DNA molecule

D. recognize a specific nucleotide sequence for binding of DNA ligase

Answer: C



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17. Which one of the following palindromic base sequences in DNA can be easily cut about the middle by some particular restriction enzyme ?



- 5' _____ CACGTA _____ 3'
- B. 3' _____ CTCAGT _____ 5'
- 5' _____ CGTTCG _____ 3'
- C. 3' _____ ATGGTA _____ 5'
- 5' _____ GATATG _____ 3'
- D. 3' _____ CTAATA _____ 5'

Answer: A



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18. An improved variety of transgenic basmati rice

- A. is completely resistant to all insect pests and diseases of paddy
- B. gives high yield but has no characteristic aroma

C. does not require chemical fertilizers and growth hormones

D. give high yield and is rich in vitamin A

Answer: D



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19. DNA or RNA segment tagged with a radioactive molecule is called :

A. Clone

B. Plasmid

C. Vector

D. Probe

Answer: D



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20. Genetic engineering has been successfully used for producing

A. transgenic Cow-Roise which produces high fat milk for making ghee

B. animals like bulls for farm work as they have super power

C. transgenic mice for testing safety of polio vaccine
before use in humans

D. transgenic models for studying new treatments
for certain cardiac diseases

Answer: C



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21. The genetically -modified (GM) brinjal in India has
been developed for

A. Enhancing mineral content

B. Drought-resistance

C. Insect-resistance

D. Enhancing shelf life

Answer: C



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22. Some of the characteristics of Bt-cotton are :

A. High yield and production of toxic protein crystals

which kill dipteran pests

B. High yield and resistance to bollworms

C. Long fibre and resistance to aphids

D. Medium yield, long fibre and resistance to beetle pests

Answer: B



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23. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands.

What is so special shown in it



A. Replication completed

B. Delection mutation

C. Start codon at the 5' end

D. Palindromic sequence of base pairs

Answer: D



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24. These is a restriction endonuclease called EcoRI.

What does "co" part in it stand for

A. Colon

B. Coelom

C. Coenzyme

D. Coli

Answer: D



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25. Agarose extracted from sea weeds finds use in

A. Spectrophotometry

B. Tissue culture

C. PCR

D. Gel electrophoresis

Answer: D





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26. Maximum number of existing transgenic animals is of:

A. Fish

B. Mice

C. Cow

D. Pig

Answer: B



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27. The process of RNA interference has been used in the development of plants resistant to

A. Nematodes

B. Fungi

C. Viruses

D. Insects

Answer: A



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28. Continuous addition of sugars in 'fed batch' fermentation is done to

A. Produce methane

B. Obtain antibiotics

C. Purify enzymes

D. Degrade sewage

Answer: B



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29. Read the following four statements (A-D)

A. The first transgenic buffalo, Roise produced milk which was human alpha-lactalbumin enriched

B. Restriction enzymes are used in isolation of DNA from other macromolecules

C. Downstream processing is one of the step of rDNA technology

D. Disarmed pathogen vectors are also used in transfer of rDNA into the host

which of the two statements have mistakes ?

A. Statements (A) and (B)

B. Statements(B) and (C)

C. Statements (C) and (D)

D. Statements (A) and (C)

Answer: A



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30. Silencing of mRNA has been used in producing transgenic plants resistant to:

- A. Bacterial blights
- B. Bollworms
- C. Nematodes
- D. White rusts

Answer: C



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31. *Bacillus thuringiensis* forms protein crystals which contain insecticidal protein. This protein:

- A. does not kill carrier bacterium which is itself resistance to this toxin
- B. binds with epithelial cells of midgut of the insect pest ultimately killing it
- C. is coded by several genes including the gene cry
- D. is activated by acid pH of the foregut of the insect pest

Answer: B



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32. Which one of the following techniques made it possible to genetically engineer living organisms ?

- A. Hybridization
- B. Recombinant DNA techniques
- C. X-ray diffraction
- D. Heavier isotope labelling

Answer: B



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33. Which one is a true statement regarding DNA polymerase used in PCR

- A. It is isolated from a virus
- B. It remains active at high temperature
- C. It is used to ligate introduced DNA in recipient cells
- D. It serves as a selectable marker

Answer: B



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34. For transformation, micro-particles coated with DNA to be bombarded from gene gun are made up of

- A. Silicon or Platinum

B. Gold or Tungsten

C. Silver or platinum

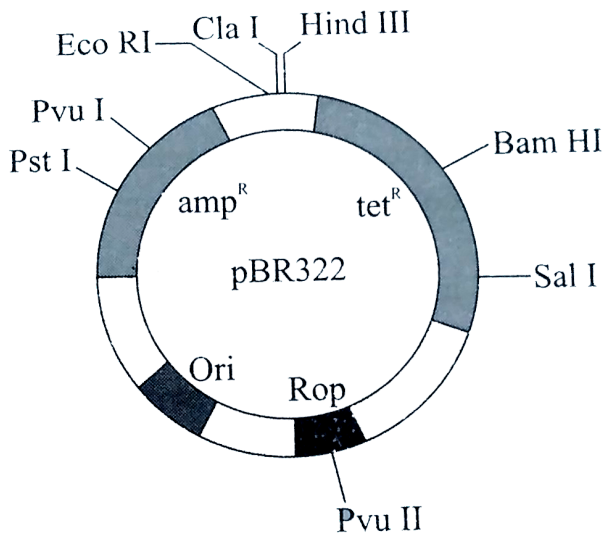
D. Platinum or zinc

Answer: B



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35. In the diagram of pBR 322, which identifies components correctly ?



- A. Hind III, EcoRI selectable markers
- B. amp^R , tet^R antibiotic resistance gene
- C. ori -original restriction enzyme
- D. rop-reduced osmotic pressure

Answer: B



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36. 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. Flaver Savr 'tomato
- D. Canolla

Answer: A



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37. DNA or RNA segment tagged with a radioactive molecule is called

- A. Clone
- B. Plasmid
- C. Vector
- D. Probe

Answer: D



Watch Video Solution

38. Which one of the following represents a palindromic sequence in DNA ?

- A. $5' - \text{CATTAG} - 3'$
 $3' - \text{GATTAAC} - 5'$
- B. $5' - \text{GATACC} - 3'$
 $3' - \text{CCTAAG} - 5'$
- C. $5' - \text{GAATTC} - 3'$
 $3' - \text{CTTAAG} - 5'$
- D. $5' - \text{CCAATG} - 3'$
 $3' - \text{GAATCC} - 5'$

Answer: C



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39. In genetic engineering, the antibiotics are used

- A. as sequences from where replication starts
- B. to keep the culture free of infection
- C. as selectable markers

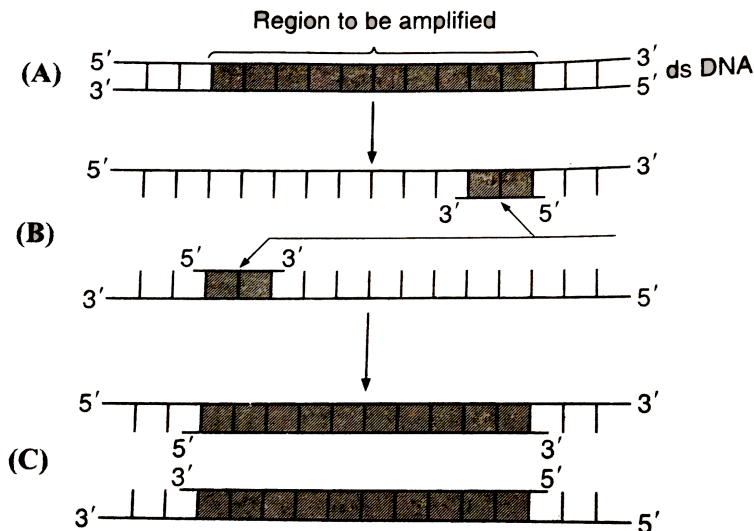
D. to select healthy vectors

Answer: C



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40. The figures below shows three steps (A,B,C) of polymerase chain reaction (PCR). Select the right one



- A. C-Extension in the presence of heat stable DNA polymerase
- B. A-Annealing with two sets of primers
- C. B-Denaturation at a temperature of about $98^{\circ}C$ separating the two DNA strands
- D. A-Denaturation at a temperature of about $50^{\circ}C$

Answer: A



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41. Biolistics (gene-gun) is suitable for

- A. Constructing recombinant DNA by joining with vector
- B. DNA finger printing
- C. Disarming pathogen vectors
- D. Transformation of plants cells

Answer: D



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42. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produced (in the host cells):

- A. an antifeedant
- B. a toxic protein
- C. both sense and anti-sense RNA
- D. a particular hormone

Answer: C



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43. The first clinical gene therapy was given for treating
:

- A. Rheumatoid arthritis
- B. Adenosine deaminase deficiency

C. Diabetes mellitus

D. Chicken pox

Answer: B



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44. The colonies of recombinant bacteria appear white in contrast to blue colonies of non-recombinant bacteria because of

A. Inactivation of glycosidase enzyme in recombinant bacteria

B. Non-recombinant bacteria containing beta-galactosidase

C. Insertional inactivation of alpha-galactosidase in non-recombinant bacteria

D. Insertional inactivation of beta-galactosidase in recombinant bacteria

Answer: D



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45. DNA fragments generated by restriction endonucleases in a chemical reaction can be separated

by

- A. Restriction mapping
- B. Centrifugation
- C. Polymerase chain reaction
- D. Electrophoresis

Answer: D



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46. Which one is used as a vector for gene transfer cloning gene ?

- A. Salmonella typhimurium DNA

B. Ti plasmid

C. Antibiotic resistance Amp^r and Ter^r loci

D. Ori minus pBR 322

Answer: B



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47. Which of the following sequence is palindromic ?

A. GAATTC

CTTAAG

B. ATGCAG

TACGTC

C. CTTAGC

GAATCG

D. TGCATC

ACGTAG

Answer: A



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48. Which one of the following technique is used to produce the GM crops ?

A. Micropropagation

B. Somatic hybridization

C. r-DNA technology

D. Cross breeding

Answer: C



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49. RNAi result in

A. Silencing of m-RNA translation

B. Silencing of a specific m-RNA due to
complementary ds RNA molecule

C. Silencing of m-RNA molecule

D. Silencing of DNA for m-RNA transcription

Answer: B



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50. An analysis of chromosomal DNA using the southern hybridization technique does not use

- A. Electrophoresis
- B. Blotting
- C. Autoradiography
- D. PCR

Answer: D



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51. Which vector can clone only a small fragment of DNA

- A. Bacterial artificial chromosome
- B. Yeast artificial chromosome
- C. Plasmid
- D. Cosmid

Answer: C



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52. The first human hormone drug produced by recombinant DNA technology genetic engineering is

A. Insulin

B. Estrogen

C. Thyroxin

D. Progesterone

Answer: A



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53. Which of the following is not naturally occurring gene

A. cry-gene

B. Bt-gene

C. RNAi, gene

D. cellular defense gene

Answer: C



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54. Bt-cotton has which of the following special feature ?

A. This plant is completely resistant to insects

B. It requires less fertilizers

C. It's leaf is resistant to pest but boll is destroyed by bollworms

D. This plant is resistant to certain insects

Answer: D



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55. The crops engineered for glyphosate are resistant/tolarant to

A. Bacteria

B. Insects

C. Herbicides

D. Fungi

Answer: C



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56. In Bt cotton, the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to

- A. Acidic pH of the insect gut
- B. Action of gut micro-organisms
- C. Presence of conversion factors in insect gut
- D. Alkaline pH of the insect gut

Answer: D



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57. which body of the government of india regulates GM reserch and safety of introducing GM organisms of public services ?

- A. Indian Council of Agricultural Research
- B. Genetic Engineering Approval Committee
- C. Research Committee on Genetic Manipulation
- D. Bio-safety committee

Answer: B



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58. The DNA molecules of which the gene of interest is integrated for cloning is called

- A. Carrier
- B. Transformer
- C. Vector
- D. Template

Answer: C



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59. 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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60. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of:

A. Vitamin A

B. Vitamin B

C. Vitamin C

D. Omega 3

Answer: A



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61. The introduction of t-DNA into plants involves

A. Allowing the plant roots to stand in water

B. Infection of the plant by *Agrobacterium tumefaciens*

C. Altering the pH of the soil, then heat shocking the plants

D. Exposing the plants to cold for a brief period

Answer: B



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62. Which one of following is method of gene silencing

A. tRNA

B. rRNA

C. RNAi

D. mRNA

Answer: C



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63. Which of the following is not a direct method of gene transfer in plants:

- A. *Agrobacterium tumefaciens*
- B. Gene gun method
- C. Biolistic method
- D. Electroporation

Answer: A



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64. Find out correct recognition sequence of following restriction endonuclease enzyme

- | | <i>BamHI</i> | <i>EcoRI</i> |
|----|--------------|--------------|
| A. | GGATCC | GAATTC |
| | CCTAGG | CTTAAG |
| | <i>BamHI</i> | <i>EcoRI</i> |
| B. | GAATCAA | TTGCAAC |
| | CTTAGTT | AACGTTG |
| | <i>BamHI</i> | <i>EcoRI</i> |
| C. | GCATGG | AGCTCC |
| | CGTACC | TCGAGG |
| | <i>BamHI</i> | <i>EcoRI</i> |
| D. | GACTAA | GCCTTA |
| | CTGATT | CGGAAT |

Answer: A



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65. Match the following columns:

Column I		Column II	
<i>A</i>	Golden rice	<i>i</i>	Eli Lily
<i>B</i>	<i>PCR</i>	<i>ii</i>	Herbert boyer
<i>C</i>	Insulin	<i>iii</i>	Kary mullis
<i>D</i>	Recombin	<i>iv</i>	Peter Bayer

A. A-iv, B-iii, C-i, D-ii

B. A-iv, B-iii, C-ii, D-i

C. A-iii, B-iv, C-i, D-ii

D. A-iii, B-iv, C-ii, D-i

Answer: A



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66. Which is pallindromic sequence :

A. GAATTC

CTTAAG

B. GCAAAG

CGTTTC

C. ATCGGC

TAGCCG

D. ATCGCT

TAGCGA

Answer: A



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67. Which one is not a restriction enzyme :

A. Eco R_1

B. Chitinase

C. Bam H_1

D. Hind -II

Answer: B



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68. Which one of the following enzyme is not involved in recombinant DNA technology

A. Exonuclease

B. Endonuclease

C. Ligase

D. Catalase

Answer: D



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69. T-DNA for gene transfer is present in:

- A. *Bacillus thuringiensis*
- B. *Meloidogyne incognita*
- C. *Agroacterium tumefaciens*
- D. *E.Coli*

Answer: C



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70. Bt. Toxin does not show harmful effect on human and non target insect, because:

- A. It is non toxic to animal and human
- B. It's receptors are not present in humans

C. Human and other animals have resistance against

Bt. Toxins

D. Acidic nature of stomach and absence of specific

receptor on human gut.

Answer: D



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71. In biotechnology what does vector means:

A. An extra chromosomal DNA that replicates autonomously

B. Carrier of disease

C. Plasmid that can transfer gene to host cell

D. Selectable markers

Answer: C



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72. Arrange the processes that occur in PCR in sequence:

A. Annealing-denaturation-extension

B. Denaturation-annealing -extension

C. Extension-denaturation-annealing

D. Denaturation -extension-annealing

Answer: B



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73. Which of the following is correct match

Column I		Column II	
<i>A</i>	<i>ADA</i> – deficiency	<i>i</i>	α – 1 antitrypsin
<i>B</i>	Emphysema	<i>ii</i>	Bone marrow transplantation
<i>C</i>	Insulin	<i>iii</i>	Diabetes mellitus
<i>D</i>	Insect resistance	<i>iv</i>	T_1 – plasmid

A. A(ii), B(i), C(iii), D(iv)

B. A(i), B(ii), C(iii), D(iv)

C. A(iii), B(iv), C(ii), D(i)

D. A(iv), B(iii), C(ii), D(i)

Answer: A



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Exercise iii

1. The basic procedure involved in the synthesis of recombinant DNA molecule is depicted below. The mistake in the procedure is



- A. Enzyme polymerase is not included
- B. The mammalian DNA is shown double stranded
- C. Only one fragment is inserted

D. Two different restriction enzymes are used

Answer: D



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2. Production of a human protein in bacteria by genetic engineering is possible because

A. Bacterial cell can carry out the RNA splicing reactions

B. The mechanism of gene regulation is identical in human and bacteria

C. The human chromosome can replicate in bacterial cell

D. The genetic code is universal

Answer: D



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3. If a recombinant DNA bearing gene for ampicillin resistance is transferred into E.Coli cells and the host cells are spread on agar plates containing ampicillin, then:

A. both transformed and untransformed recipient cells will die

B. both transformed and untransformed recipient cell will be grow

C. transformed recipient cells grow and untransformed recipient cells will die

D. transformed recipient cells will die and untransformed recipient cells will grow

Answer: C



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4. If haemoglobin (Hb) of a normal individual and a sickle-cell anaemia patient are run in electrophoretic field, they will show

- A. same mobilities
- B. different mobilities
- C. Hb of patient will not move at all
- D. Hbs are immobile

Answer: B



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5. Introduction of food plants developed by genetic engineering is not desirable because

- A. Economy of developing countries may suffer
- B. These products are less tasty as compared to the already existing products
- C. This method is costly
- D. There is danger of coming viruses and toxins with introduced crop

Answer: D



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6. Which one of the following is a correct statement

- A. 'Bt' in "Bt-cotton" indicates that it is a genetically modified organism produced through biotechnology
- B. Somatic hybridization involves fusion of two complete plant cells carrying desired genes
- C. The anticoagulant hirudin is being produced from transgenic *Brassica napus* seeds
- D. 'Flavr Sacr' variety of tomato has enhanced the production of ethylene which improves its taste

Answer: C



7. Which of the following tools of recombinant DNA technology is incorrectly paired with its use

A. restriction enzyme-Production of RFLPs

B. DNA ligase-that joins DNA, creating the sticky ends

C. DNA polymerase - used in a polymerase chain reaction to amplify section of DNA

D. reverse transcriptase - production of cDNA from mRNA

Answer: B



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8. Select the incorrect statement for continuous culture system

- A. In this used medium is drained out from one side while fresh medium is added from other side
- B. In this cells are maintained in their physiologically most active lag phase of growth
- C. It produces larger biomass
- D. It shows higher yields of desired products

Answer: B



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9. In r-DNA technology or genetic engineering elution means-

- A. Remove the DNA from centrifuge tube after centrifugation
- B. The separated band of DNA are cut out from the gel and extracted from the gel piece
- C. Separation of the recombinant protein from recombinant cell

D. Insertion of recombinant DNA into host cell

Answer: B



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10. An example of gene therapy is

A. Production of injectable Hepatitis-B vaccine

B. Production of vaccines in food crops like potatoes
which can be eaten

C. Introduction of gene for adenosine deaminase in
persons suffering from
severe combined immuno -deficiency (SCID)

D. Production of test tube babies by artificial insemination and implanaton of fertilized eggs

Answer: C



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Exercise Iv

1. Assertion: Biotechnology deals with techniques of using live organisms or enzymes from organisms to produce product & prcoesses useful to humans.

Reason :It is the integration of natural science and

organisms, cells, their parts and molecular analogue for products & services

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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2. Assertion: The techniques of genetic engineering allow us to isolate & introduce only desired genes without introducing undesirable genes

Reason :Traditional hybridization procedure lead to inclusion of undesirable genes along with desirable genes

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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3. Assertion: The name of any restriction endonuclease ends with a Roman number

Reason : Roman number indicate the order in which the enzyme were discovered from that strain of bacteria

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: C



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4. Assertion: Restriction endonucleases produces overhanging stretches called sticky ends on each DNA strand

Reason :Restriction enzymes cut the strand of DNA a little away from the centre of pallindrome sites

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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5. Assertion: The stickiness of ends produced by restriction endonuclease facilitates the action of DNA

polymerase

Reason :It helps in joining the two DNA strands

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: D



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6. Assertion: Each restriction endonuclease recognises a specific pallindromic nucleotide sequence in the DNA

Reason :The pallindrome in DNA is a sequence of base pairs that reads same on the two strands in a particular direction

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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7. Assertion: The recombinant DNA molecule cannot be created, unless one cuts the vector & source DNA with same restriction enzyme

Reason :When cuts by same enzyme both will have same sticky ends, that can be joined by DNA ligase

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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8. Assertion: The DNA fragments can be separated by a technique known as Gel electrophoresis

Reason : The fragments separate according to their shape through the sieving effect provided by agarose gel

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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9. Assertion: One can see bright orange coloured band of DNA in an ethidium bromide stained gel exposed to

infra-red light

Reason :One cannot see pure DNA fragments in the visible & UV light & without staining

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: D



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10. Assertion: In Gel electrophoresis, "the smaller the fragment size, the farther it moves"

Reason : The separation of DNA segments by cutting out the gel is known as elution

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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11. Assertion: Presence of restriction sites of many enzymes within the vector is not desirable

Reason : It will generate several fragments which will complicate the process

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: D



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12. Assertion: A good vector in that whose ori support high copy number

Reason :It helps in identifying & eliminating non-transformants & permitting the growth of transformants

A. If both Assertion & Reason are True & the Reason

is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is

not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: C



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13. Assertion: The genes encoding resistance to antibiotics are considered as useful selectable markers for E.coli

Reason :The normal E.coli does not carry resistance against any of the antibiotics

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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14. Assertion: The inactivation of any vector gene due to insertion of desired gene called as insertional

inactivation

Reason :Some time restriction sites are also present in between the gene sequence of vector

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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15. Assertion: Recombinant colonies will produce blue colour in the medium having X-gal compound

Reason : The 'gal gene' of vector undergone insertional inactivation

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: D



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16. Assertion: Ti-plasmids & retrovirus are used as vectors in gene transfer process

Reason :They have the natural art of delivering genes in their eukaryotic hosts

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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17. Assertion: DNA cannot pass through cell membranes

Reason : DNA is a hydrophobic molecule

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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18. Assertion: Bacterial cells first be made competent by monovalent cations, to take up DNA

Reason :It increases the efficiency with which DNA enters the bacterium through the pores in cell wall

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: D



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19. Assertion: In biolistics method, cells are bombarded with high velocity micr-particles of gold or tungsten coated with DNA

Reason :It is suitable for plant cells

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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20. Assertion: Restriction enzyme digestions are performed by incubating purified DNA molecule with restriction enzyme

Reason :Agarose gel electrophoresis is employed to check the progression of restriction enzyme digestion

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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21. Assertion: A thermostable DNA polymerase is used in PCR for repeated amplification

Reason :It remain active during high temperature induced denaturation of ds DNA

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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22. Assertion: The ampicillin resistance gene is called as selectable marker gene

Reason : If host cells are spreaded on agar plates containing ampicillin and only untransformed cells will survive

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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23. Assertion: The recombinant cells are multiplied in a continuous culture system

Reason :It is to maintain the cells in their physiologically most active log/exponential phase

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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24. Assertion: A bioreactor provides the optimal conditions for achieving the desired product by providing optimum growth conditions.

Reason :Bioreactors are vessels in which raw materials are biologically converted into specific products using microbial, plant or animal cells

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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25. Assertion: The most commonly used bioreactors are of stirring type

Reason : The stirrer facilitates even mixing & oxygen availability throughout the bioreactor

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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26. Assertion: The process including separation & purification of product are collectively referred as

downstream processing

Reason :The downstream processing & quality control testing are same for all type of products

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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27. Assertion: Genome of an organism can be changed for our benefit by genetic engineering

Reason : Specific gene can be introduced into an organism for the synthesis of a desired product

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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28. Assertion: Polymerase chain reaction is nick named as people's choice reation

Reason :This technique is used to amplify a specific desired DNA fragment

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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29. Assertion: Gene gun method is a direct gene transfer method.

Reason :In this method foreign gene directly introduce in target cell without involving vector DNA

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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30. Assertion: The techniques of genetic engineering have great advantage over traditional hybridisation procedure used in plant and animal breeding

Reason :Recombinant DNA technology allows us to isolate and introduce only desirable gene without introducing undesirable genes into the target organism

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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31. Assertion: Green revolution succeeded in tripling the food supply

Reason :It is mainly due to the use of better management practices use of agrochemicals

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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32. Assertion: GM technique has been used to create tailor made plants to supply alternative resources to industries

Reason : Plants, bacteria, fungi & animals whose genes have been altered by manipulation are called GMO

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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33. Assertion: *Bacillus thuringiensis* produces protein that kills lepidopteran insect only

Reason :It forms active protein crystals during a particular phase of their growth

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: D



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34. Assertion: Crystal protein does not kill the Bacillus & kill only insect

Reason :In Bacillus it exist as inactive proteins but in insect it is converted into an active form due to acidic pH of the gut

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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35. Assertion: The activated toxin binds to the surface of midgut epithelial cells & create pores that cause cell swelling & lysis & finally death of insect

Reason :Most of Bt toxins are insect group specific

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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36. Assertion: The choice of cry-gene depends upon the crop & the targeted pest

Reason :Gene cry Iac & cry II Ab control the cotton bollworms while cry Iab controls corn borer

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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37. Assertion: RNAi involves silencing of a specific mRNA due to complementary RNA that bind to & prevents translation of the mRNA

Reason :RNAi takes place in all prokaryotic organisms as a method of cellular defense

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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38. Assertion: The nematode parasite could not survive in a transgenic plant expressing specific interfering RNA

Reason :The sense & anti -sense RNA in host are complemenatry & forms a ds RNA, thus silenced the specific m RNA of nematod

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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39. Assertion: The recombinant therapeutics do not induce unwanted immunological responses.

Reason :About 30 recombinant therapeutics have been approved for human use world -wide

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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40. Assertion: The proinsulin contains an extra stretch called as C-peptide

Reason :Insulin consists of two short polypeptide chains A & B that are linked together by disulphide bridges

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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41. Assertion: The main challenge for production of insulin using r-DNA technique was getting insulin

assembled into a mature forms

Reason :The C-peptide is not present in mature insulin
& is removed during maturation process

- A. If both Assertion & Reason are True & the Reason
is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is
not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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42. Assertion: Eli Lilly prepared two DNA sequences of A & B chains of insulin & introduced them in the plasmids of one E.coli

Reason :Chains A & B produced by this E.coli is extracted & combined by creating disulfide bonds to form insulin

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: D



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43. Assertion: Gene therapy is a collection of methods that allows correction of a gene defect diagnosed in a child or embryo

Reason :It involves delivery of normal gene into the individual or embryo to take over the function of the non functional gene

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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44. Assertion: ADA deficiency can not be cured permanently by gene therapy

Reason :The genetically engineered lymphocytes are immortal only in culture conditions

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: D



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45. Assertion: In gene therapy of SCID, a patient requires periodic infusion of genetically engineered

lymphocytes

Reason :If the ADA gene is introduced into cells at early embryonic stage, it could be a permanent cure

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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46. Assertion: For effective treatment of a disease, early diagnosis & understanding its pathophysiology is very important

Reason :r-DNA technique, PCR & ELISA serve the purpose of early diagnosis

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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47. Assertion: ELISA is based on the principle of antigen antibody interaction

Reason :Infection by pathogen can be detected by the presence of antigens or by detecting antibodies synthesized against the pathogen

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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48. Assertion: PCR is a powerful technique to identify many genetic disorders

Reason :PCR is now routinely used to detect HIV in suspected AIDS patients

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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49. Assertion: A ds DNA, tagged with a radioactive molecule (probe) is used in medical diagnosis

Reason :It is complementary to mutated gene

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: D



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50. Assertion: Transgenic animals are those animals whose DNA is manipulated to process & express an

extra /foreign gene

Reason :About more than 95% of all existing transgenic animals, are mice

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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51. Assertion: Many transgenic animals are designed to study how gene contribute to the development of disease

Reason :It is not possible to study, how genes are regulated & how they affect normal functions of body by transgenic animals

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: C



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52. Assertion: The milk of 1st transgenic cow, 'Rosie' is far better than natural cow milk

Reason :It produces human protein - alpha lactalbumin enriched milk

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: A



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53. Assertion: Transgenic mice are being used to test the safety of the polio vaccine

Reason :They could not replace the use of monkeys to test the safety of batches of the vaccine

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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54. Assertion: Transgenic animals are now used in toxicity testing of various toxic chemicals

Reason :Such animals carry gene which make them more sensitive to toxic substances

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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55. Assertion: Biopiracy refers to the use of bio-resources by multinational companies without proper

authorization from the countries

Reason :The Indian government has set up GEAC to prevent biopiracy

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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56. Assertion: *Bacillus thuringiensis* is not killed by its own toxin

Reason : Bt toxin protein exist as inactive protoxins

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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57. Assertion: The protein encoded by cry I Ab is not effective in control of cotton bollworms

Reason :Most Bt toxin are insect group specific

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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58. Assertion: GEAC will make decision regarding the validity of GM research and the safety of introducing GM organisms for public services

Reason :Genetic modification of organism can have unpredictable result when such organisms are introduced into the ecosystem

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assetion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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59. Assertion: Transgenic mice are being developed for use in testing the safety of vaccines before they are used on human

Reason :They are being used to test the safety of polio vaccine

A. If both Assertion & Reason are True & the Reason

is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is

not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: B



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60. Assertion: Bt -toxines kills the Bacillus thuringiensis

Reason :Bt-toxins exist as active toxins in Bacillus thuringiensis

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: D



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61. Assertion: Transgenic crops are avoided growing in areas where their wild relative or weeds occurs in fields or surrounding areas

Reason :Transgene may be transferred through pollen from these crops to their wild relatives. Such a gene

transfer may make the weed more prominent and damaging

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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62. Assertion: GM food which is prepared from GM crops may be more nutritious and good for health than its natural variant

Reason :Bacteria present in the alimentary canal of human could take up the antibiotic resistance gene than is present in GM food. The bacteria would then become resistant to concerned antibiotic

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

C. If Assertion is True but the Reason is False

D. If both Assertion & Reason are false

Answer: B



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63. Assertion: Genetic engineering is helpful in development of high yielding varieties of plant as it introduces new genes into host plants

Reason :Disease resistance and high yielding varieties can only be produced through genetic engineering

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: C



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64. Assertion: Genetic engineering is a quick and reliable technique for producing GM plants but is facing resistance from people

Reason :It is facing resistance because it contains bacterial genes which may be toxic and causes allergy

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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Exercise I

1. Which one of the following is not true about antibiotics

A. First antibiotic was discovered by Alexander Fleming

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

C. Some person can be allergic to a particular antibiotic

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

Answer: D



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2. Antibiotics are mostly obtained from

- A. Bacteria
- B. Actionmycetes
- C. Cyanobacteria
- D. 1 & 2

Answer: D



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3. Which of the microorganisms is used for production of citric acid in industries ?

A. *Lactobacillus bulgaricus*

B. *Penicillium citrinum*

C. *Aspergillus niger*

D. *Rhizopus nigricans*

Answer: C



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4. The microorganism grown on molasses and sold as a food flavouring substance is

A. Saccharomyces

B. Rhizopus

C. Acetobacter

D. Lactobacillus

Answer: A



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5. Formation of vinegar from alcohol is caused by

A. Bacillus subtilis

B. Clostridium

C. Acetobacter acetic

D. Azotobacter

Answer: C



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6. Biogas consists of

A. Carbon monoxide, methane and hydrogen

B. Carbon dioxide, methane and hydrogen

C. Carbon monoxide, ethane and hydrogen

D. Carbon dioxide, ethane and hydrogen

Answer: B



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7. The pioneer country in the production of fuel-alcohol is

A. Japan

B. Brazil

C. Saudi Arabia

D. India

Answer: B



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8. For biogas production besides dung which one of the following weed is recommended in our country

A. *Mangifera indica*

B. *Hydrilla*

C. *Eichhornia crassipes*

D. *Solanum*

Answer: C



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9. Most of the petrocrops belong to family

A. Leguminoase

B. Euphorbiaseae

C. Rutanceae

D. Malvaceae

Answer: B



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10. Who is credited with indentifying petro crops?

A. M.S.Swaminathan

B. M.Calvin

C. H.Krebs

Answer: B



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11. Biogas production from waste biomass with the help of methanogenic bacteria is

- A. One step process
- B. Two step process
- C. Three step process
- D. Multistep process

Answer: C



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12. Beer is fermented from

A. Molasses

B. Grapes

C. Barley

D. Rye

Answer: C



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13. Maximum percentage of alcohol present in the product of yeast fermentation

A. Brandy

B. Gin

C. Rum

D. Wine

Answer: A



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14. First fermented acid is

A. Gluconic acid

B. Lactic acid

C. Fumaric acid

D. All the above

Answer: B



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15. Which of the following Microorganisms use for swiss cheese

A. Propionibacterium

B. Geotrichum

C. Penicillium

D. Streptococcus

Answer: A



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16. Rate limiting material in biogas products is

A. Methane

B. Cellulose

C. Starch

D. Acetic acid

Answer: B



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17. Which group is not related with petroplantation

A. Euphorbiaceae

B. Asclepiadiaceae

C. Apocyanaceae

D. Leguminaceae

Answer: D



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18. What are the advantage of gobar gas over convential utilization

- A. More efficient source of energy
- B. Used as good fertilizer
- C. Reduces the chances of spreading of pathogens
- D. All the above

Answer: D



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19. Cheese and Yoghurt are porduct of the porcess

A. Pasteurisation

B. Distillation

C. Dehydration

D. Fermentation

Answer: D



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20. Milk is converted into curd by :

A. Bacillus Megatheium

B. Acetobactor acetic

C. Xanthomonas citri

D. *Lactobacillus acidophilus*

Answer: D



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21. *Saccharomyces cerevisiae* is used in the formation of

A. Ethanol

B. Methanol

C. Acetic acid

D. Antibiotics

Answer: A



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22. Modern farmer's can increase the yield of Paddy upto 50% by the use of

- A. Cyanobacteria
- B. Rhizobium
- C. Mycorrhiza
- D. Farum yard manure

Answer: A



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23. Which one produce gas by decomposing the gobar (Dung) in gobar gas

A. Fungus

B. Virus

C. Methanogenic bacteria

D. Algae

Answer: C



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24. Which of the following is used to manufacture ethanol from starch

- A. Penicillin
- B. Saccharomyces
- C. Azotobactor
- D. Lactobacillus

Answer: B



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25. Which of the following is the pair of biofertilizers

A. Azolla and BGA

B. Nostoc and legume

C. Rhizobium and grasses

D. Salmonella & E.coli

Answer: A



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26. Which bacteria is utilized in Gobar gas plant

A. Methanogens

B. Nitrifying bacteria

C. Ammonifying bacteria

D. Denitrifying bacteria

Answer: A



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27. In manufacture of bread, it becomes porous due to release of CO_2 by the action of

A. Yeast

B. Bacteria

C. Virus

D. Protozoans

Answer: A



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28. During anaerobic digestion of organic waste, such as in the producing biogas, Which one of the following is left undegraded ?

A. Lipids

B. Lignin

C. Hemi-cellulose

D. Cellulose

Answer: B

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29. The terms "antibiotic " was coined by:

- A. Edward Jenner
- B. Louis Pasteur
- C. Selman waksman
- D. Alexander Fleming

Answer: C

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30. Recently government of India has allowed mixing of alcohol in petrol. What is amount of alcohol permitted for mixing in petrol

A. 0.05

B. 2.5 %

C. 10 – 15 %

D. 0.1

Answer: A



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31. A free-living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern *Azolla* is :

A. *Anabaena*

B. *Tolypothrix*

C. *Chlorella*

D. *Nostoc*

Answer: A



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32. The technology of biogas production was developed in India mainly due to the efforts of

A. IARI

B. KVIC

C. both 1 and 2

D. WHO

Answer: C



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33. IPM (Integrated Pest Management) involves

Or

Latest trend in plant disease control is

- A. Tissue culture
- B. biological control
- C. bio-fertilizers
- D. confusion technique

Answer: B



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34. Biogas produced by anaerobic fermentation of water biomass consists of

- A. methane

B. traces of H_2 , H_2S and N_2

C. CO_2

D. all of these

Answer: D



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35. Which one of the following is not used in the production of yoghurt

A. *Streptococcus lactis*

B. *Streptococcus thermophilus*

C. *Lactobacillus bulgaris*

D. Both 2 and 3

Answer: A



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36. Which one of the following is usedd in the baking of the bread

Or

Baker's yeast is

Or

The dough used for making bread is fremented by

A. Rhizopus stolonifer

B. Saccharomyces cerevisiae

C. Zygasaccharomyces

D. Saccharomyces ludwigi

Answer: B



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37. Cyclosporin A, used as immunosuppressive agent is obtained from

A. Bacterium

B. Fungus

C. Virus

D. Plant

Answer: B



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38. A common biocontrol agent for the control of plant diseases is

A. Agrobacterium

B. Glomus

C. Trichoderma

D. Baculovirus

Answer: C



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39. Which one of the following helps in absorption of phosphorus from soil by plants

or

Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition

A. Glomus

B. Trichoderma

C. Azotobacter

D. Aspergillus

Answer: A



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40. Lactic acid bacteria (LAB) grow in milk and convert it to curd and also improve its nutritional quality by increasing

A. Vitamin A

B. Vitamin B_{12}

C. Vitamin B_6

D. Vitamin C and A

Answer: B



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41. Rising of dough is due is

- A. Growth of LAB
- B. Production of O_2 & ethanol
- C. Production of CO_2
- D. Growth of yeast *Monascus*

Answer: C



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42. From given table choose that alcoholic drinks which are produced without distillation of fermented broth

Whisky, Wine
Brandy, Rum, Beer

A. Whisky

B. Brandy

C. Rum

D. Wine

Answer: D



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43. Select the correct match

A. *Aspergillus niger*-Acetic acid

B. Streptokinase-Immunosuppressive

C. Cyclosporin -A-Clot buster

D. Statins -Cholesterol lowering agent

Answer: D



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44. Biogas is the mixture of gases produced by the microbial activity. The type of the gas produced depends upon

A. type of microbes

B. type of organic substrate/waste

C. size of digester

D. 1 & 2 both

Answer: D



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45. Which biocontrol agent is very common in root ecosystem & is effective against several plant pathogens.

A. Baculoviruses

B. Trichoderma

C. Nucleopolyhedro virus

D. Ladybird beetle & Dragonflies

Answer: B



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46. Integrated pest management (IPM) is based on

- A. Biological control of pest
- B. Mechanical control
- C. Carefully timed used of pesticides
- D. All the above

Answer: A



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47. Which of the following is the examples of biofertilizers ?

- A. Gree manure
- B. Compost manure
- C. BGA and VAM
- D. Green manure & chemical fertilizers

Answer: C



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48. Which of the following bacterium is associated with production of bioinsecticides ?

- A. *Bacillus subtilis*
- B. *Bacillus thuringensis*
- C. *Agrobacterium*
- D. *Azotobactor*

Answer: B



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49. The use of predator to control a pest is called

A. Genetic engineering

B. biological control

C. Chemical control

D. Artifical control

Answer: B



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50. Bio pesticide include

A. Only bioinsecticide

B. Only bioherbicide

C. Bioinsecticide & bioherbicide

D. Bioherbicide, bioinsecticide & biofertilisers

Answer: C



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51. Bacillus thuringiensis is used to control

A. Moth

B. Flies

C. Mosquito

D. All the above

Answer: D



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52. All of the following is a part of part of IPM (Integrated Pest Management) except

- A. Use of resistant varieties
- B. Use of crop rotation
- C. Biological & Mechanical control of pests
- D. Regular use of high dose of pesticides from
beginning to end of the crop

Answer: D



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53. BGA is chiefly used as fertilizer in

A. Wheat

B. Gram

C. Mustard

D. Paddy

Answer: D



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54. The material of biological origin, which is used to maintain and improve soil fertility is

- A. Bio pesticide
- B. Bionutrient
- C. Chenical fertilizers
- D. Green manure

Answer: D



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55. Which of the following statements is incorrect ?

- A. Biofertilizers are used to maintain and improve soil fertility

B. Chemical fertilizers pollute soil and water resources

C. Chemical fertilizers are expensive

D. Most pesticide used these days are specific in nature

Answer: D



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56. *Trichoderma harizianum* has proved to be a useful microorganism for

A. Gene transfer in higher plants

B. Biological control of soil-borne plant pathogens

C. Bioremediation of contaminated soils

D. reclamation of wastelands

Answer: B



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57. Which of the following is a symbiotic nitrogen fixer ?

A. Azolla

B. Glomus

C. Azotobacter

D. Frankia

Answer: A



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58. A petroleum plants is

A. *Euphorbia lathyrus*

B. *Acacia arabica*

C. *Pinus roxburghii*

D. *Prosopis cineraria*

Answer: A



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59. Which is a microbial insecticide ?

- A. *Bacillus polymixa*
- B. *Bacillus brevis*
- C. *Bacillus subtilio*
- D. *Bacillus thuringensis*

Answer: D



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60. Ladybird is useful to get rid of

- A. Aphids

B. Mosquitoes

C. Boll worms

D. Jassids

Answer: A



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Exerciseii

1. Which one of the following is being tried in India as a biofuel substitute for fossil fuels?

A. Jatropha

B. Musa

C. Aegilops

D. Azadirachta

Answer: A



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2. Which one of the following is a wrong matching of a microbe and its industrial product, while the remaining three are correct:-

A. *Aspergillus niger*-citric acid

B. Yeast -Statins

C. *Acetobacter acetic-acetic acid*

D. *Clostridium butylicum* -lactic acid

Answer: D



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3. Read the following statement having two blanks (A and B):

"A drug used for ____ (A) ____ patients is obtained from a species of the organism ____ (B) ____."

The one correct option for the two blanks is :

	Blank - A	Blank-B
A.	<i>AIDS</i>	<i>Pseudomonas</i>

- Blank -A Blank-B
- B. Heart Penicillium
- Blank -A Blank-B
- C. Organ-transplant *Trichoderma*
- Blank -A Blank-B
- D. Swine flu Monascus

Answer: C



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4. Yeast is used in the production of

- A. Bread and beer
- B. Cheese and butter
- C. Citric acid and lactic acid
- D. Lipase and pectinase

Answer: A



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5. A patient brought to a hospital with myocardial infraction is normally immediately given

A. Cyclosporin -A

B. Statins

C. Penicillin

D. Streptokinase

Answer: D



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6. Which one of the following is an example of carrying out biological control of pests/diseases using microbes

- A. Bt-Cotton to increase cotton yield
- B. Lady bird beetle against aphids in mustard
- C. Trichoderma sp. against certain plant pathogens
- D. Nucleopolyhedrovirus against white rust in Brassica

Answer: C



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7. The most abundant prokaryotes helpful to humans in making curd and in production of antibiotics are ones categorised as:

- A. Chemosynthetic autotrophs
- B. Heterotrophic bacteria
- C. Cyanobacteria
- D. Archaeobacteria

Answer: B



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8. *Monascus purpureus* is a yeast used commercially in the production of

A. citric acid

B. blood cholesterol lowering statins

C. ethanol

D. streptokinase for removing clots from the blood vessels

Answer: B



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9. In gobar gas, the maximum amounts is that of

Or

Biogas produced through anaerobic fermentation of organic material is primarily

A. Propane

B. Carbon dioxide

C. Butane

D. Methane

Answer: D



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10. Consider the following four statement (1-4) and select the option which includes all the correct ones only

(1) Single cell Spirulina can produce large quantities of food rich in protein, minerals, vitamins etc

(2) Body weight-wise the microorganism Methylophilus methylotrophus may be able to produce several times more proteins than the cows per day

(3) Common button mushrooms are a very rich source of vitamin C

(4) A rich variety has been developed which is very rich in calcium

A. Statements (b), (c) and (d)

B. Statements (a), (b)

C. Statements (c),(d)

D. Statements (a), (c) and (d)

Answer: B



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11. A good producer of citric acid is :

A. Saccharomyces

B. Aspergillus

C. Pseudomonas

D. Clostridium

Answer: B



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12. During sewage treatment, biogases are produced which includes :

- A. hydrogensulphide, nitrogen, methane
- B. methane, hydrogensulphide, carbon dioxide
- C. methane, oxygen, hydrogensulphide
- D. hydrogensulphide, methane, sulphur dioxide

Answer: B



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13. Which of the following statements is correct regarding microbes in human welfare ?

A. *Saccharomyces cereviceae* is useful in industries for production of citric acid

B. *Trichoderma polysporum* is used as blood cholesterol lowering agent

C. *Aspergillus niger* used to obtain acetic acid

D. In sewage treatment CO_2 , H_2 , and CH_4 gases are produced from activated sludge by bacteria such as *Methanobacterium*

Answer: D



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14. Choose the correct statement

A. *Aspergillus niger* is bacterium which is used for obtaining acetic acid & citric acid

B. Streptokinase is used as a clot buster

C. *Monascus purpureus* is responsible for production of large holes in Swiss cheese

D. Toddy is manufactured by *Lactobacillus*

Answer: B



15. Match the following list of microbes and their importance :

(a)	<i>Saccharomyces cerevisiae</i>	(i)	Production of immunosuppressive agents
(b)	<i>Monascus purpureus</i>	(ii)	Ripening of Swiss cheese
(c)	<i>Trichoderma polysporum</i>	(iii)	Commercial production of ethanol
(d)	<i>Propionibacterium sharmanii</i>	(iv)	Production of blood cholesterol lowering agents

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

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

Answer: B



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16. Match the following column correctly

Column I		Column II	
<i>A</i>	Statins	<i>i</i>	<i>Monascus purpureus</i>
<i>B</i>	Cyclosporins	<i>ii</i>	<i>Trichoderma</i>
<i>C</i>	Acetic acid	<i>iii</i>	<i>Acetobacter acetic</i>
<i>D</i>	Butyric acid	<i>iv</i>	<i>Clostridium butyricum</i>

A. *A – i, B – ii, C – iii, D – iv*

B. *A – ii, B – i, C – iv, D – iii*

C. *A – ii, B – i, C – iii, D – iv*

D. $A - iii$, $B - iv$, $C - i$, $D - ii$

Answer: A



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17. Assertion : Biological farming approach is to become familiar with the various life forms that inhabit the field, predators as well as pests, and also their life cycles, pattern of habitat

Reason : Chemical methods are often used to kill both useful and harmful life forms indiscriminately

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion

- B. It both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: B



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18. Assertion : Organic farming is very beneficial for farmers to increase crop production

Reason : Bacteria, fungi, mycorrhiza, cyanobacteria are better biofertilizer which fix nitrogen and increase soil fertility

- A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion
- B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion
- C. If Assertion is True but the Reason is False
- D. If both Assertion & Reason are false

Answer: A



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