BIOLOGY

BOOKS - CENGAGE BIOLOGY (HINGLISH)

BIOTECHNOLOGY:PRINCIPLES AND PROCESSES

Exercises

1. 3'-5 exonucleolytic degradation of DNA is performed by which enzyme ?

A. DNA polymerase

B. Alkaline phosphatase

C. DNA ligase

D. RNA polymerase

Answer: A

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2. The technique of gel electrophoresis was developed by

A. Kary Mullis

B. J.S Chamberlain

C. A. Tiselius

D. F.Sanger

Answer: C

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3. Which of the following dyes can be used to visualize nucleic acid after electrophoresis ?

A. Acridine orange

B. Ethidium bromide

C. Bromophenol blue

D. Both (1) and (2)

Answer: D

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4. Which othe following bonds are formed by the action of DNA ligase ?

A. Sugar-phosphate bond

B. Phosphodiester bond

C. Both (1) and (2)

D. Phospahate-phosphate bodn

Answer: C

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5. Who were responsible for the isolation of "methylase" kind of enzyme from E coli in 1960's ?

A. Cohen and Boyer

B. Banting and Best

C. Linn and Arber

D. Smith and Wilcox

Answer: C

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6. The specific sequence recognized by "molecular scissors" is called

A. Isomer

B. Isobar

C. Misnomer

D. Palindrome

Answer: D

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7. When a piece of DNA is digested with Eco RI, what kind of ends are created ?

A. Blunt ends

B. Flush ends

C. Cohesive ends

D. Non-staggered ends

Answer: C

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8. The sticky ends generated by the action of Eco RI on insert DNA facilitate the action of which enzyme ?

A. DNA polymerase

B. Taq polymerase

C. Alkaline phosphatase

D. DNA ligase

Answer: D

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9. Which is incorrect with respect to DNA polymerase III?

A. It requires ATP for polymerase action.

B. It is required for PCR.

C. It is more active than DNA polymerases I and II.

D. It is requires a pre-formed DNA template to work on.

Answer: B

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10. Which is not an application of modern biotechnology ?

A. Production of humulin

B. Developing a DNA vaccine

C. Gene therapy

D. Production of cheese and butter

Answer: D

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11. Which of the following cannot be related to biotechnology ?

A. Integration of natural science and organisms.

B. Techniques to alter the chemistry of DNA.

C. Introducing undersirable genes into the target organism.

D. Maintenance of sterile ambience to enable the growth of only the desired microbes.

Answer: C

12. Which of the following specific DNA sequence is responsible for initiating replication ?

A. Vector site

B. Restriction enzymes action site

C. Ori site

D. Palindromic site

Answer: C

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13. Autonomously replicating, circular, extra chromosomal DNA of prokaryotic cell is called

A. Satellite DNA

B. Plasmid

C. Recombinant DNA

D. Nucleoid

Answer: B

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14. Key tools to be involved in recombinant DNA technolgy are

Restriction enzymes

Polymerase enzyme

Ligase enzymes

Vectors

A. (A) only

B. (A) and (C) only

C. (A) , (B) and (C)

D. (A),(B) ,(C) and (D)

Answer: D

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15. The first restriction endonuclease to be discovered was

A. Hind II

B. Eco RI

C. Bam HI

D. Pst I

Answer: A

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16. Approximately how many restriction enzymes have been isolated from the different (over 230) strains of bacteria:

A. 300

B. 600

C. 750

D. 900

Answer: D

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17. The conventional method for naming restriction enymes is followed. In case of Eco RI the "R" indiates

A. Genus

B. Species

C. Name of the scientist

D. Strain

Answer: D

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18. The restriction endonuclease enzyme binds to the DNA and cuts

A. Any one stand of the double helix

B. Each of the two strands at specific points in their base-sugar bonds

C. Each of the two strands at specific points in their base-phosphate bonds

D. Each of the two strands at specific points in their sugar-phosphate

backbones

Answer: D

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19. Which of the following palindromic sequence is recognized by Eco RI ?

A. $^{5'}G\downarrow AATTC^{3'}$
$_{3'}CTTAA_{\uparrow}G_{5'}$

B. $^{5'}CCC\downarrow GGG^{3'}$
$_{3'}GGG_{\uparrow}CCC_{5'}$

C. $^{5'}ACT\downarrow ACT^{3'}$
$_{3'}TCA_{\uparrow}TGA_{5'}$

D. $^{5'}G\downarrow GATTC$
$_{3'}CCTAG_{\uparrow}G$

Answer: A

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20. During gel electrophoresis for separation of DNA fragment :

A. Smallest fragment will move to the farthest point towards cathode

B. Smallest fragment will move to the farthest point towards anode

C. Largest fragment will move to the farthest point towards cathode

D. Largest fragment will move to the farthest point towards anode

Answer: B

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21. After electrophoresis the separated DNA fragment can be vishualised ethidium bromide gel exposed UV light . These DNA fragments appear as _____ coloured bands :

A. Orange

B. Blue

C. Silver

D. Green

Answer: A

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22. The procedure through which a piece of DNA is introduced in a host bacterium is called

A. Cloning

B. Transformation

C. PCR

D. Clonal selection

Answer: B

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23. After completing the transformation experiment involving the coding sequence of enzyme n -galactosidase, the recombinant colonies should:

A. Give blue colour

B. Not give blue colour

C. Have active β-galactosidase

D. Both (2) and (3)

Answer: B

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24. Which of the flowing has the ability to transform normal cell into cancerous cell in animal

A. Agrobacterium tumifaciens

B. Retroviruses

C. DNA viruses

D. Plasmids

Answer: B

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25. Which of the following is not applicable to Agrobacterium tumifaciens?

A. Pathogen of several dicot plants.

B. Has the ability to transform normal plant cells.

C. Delivers gene of our interest.

D. Ti plasmid of it is always pathogenic to plants without any exception.

Answer: D

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26. Insertional inactivation is related to:

A. Microinjection

B. Gene gun

C. Gel electrophoresis

D. Selection of recombinants

Answer: D

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27. For transformation with recombinan DNA, the bacterial cells must first be made compentent which means

A. Should increase their metabolic reactions

B. Should decrease their metabolic reactions

C. Increase efficiency with which DNA enters the bacterium

D. Ability to divide fast

Answer: C

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28. Which of the following methods can be used for making the bacterial cell " competent" ?

A. Treating with specific concentration of divalent cation $\left(Ca^{2+}\right)$

B. Treating with specific concentration of monovalent cation $\left(K^{+}\right)$

C. Heat shock

D. Both (1) and (3)

Answer: D

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29. Which of the following techniques can be used to introduce foreign DNA into cell?

A. Using disarmed pathogen

B. Microinjection

C. Gene gun

D. All of these

Answer: D

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30. During heal shock, the temperature used for giving thermal shock to the bacterium is

A. $82^{\circ} C$

B. $100^{\circ} C$

C. Liquid nitrogen

D. $42^{\circ} C$

Answer: D

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31. Which of the following enzymes is used in case of fungus to cause the release of DNA along with other macromolecules?

A. Lysozyme

B. Cellulase

C. Chitinase

D. Amylase

Answer: C

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32. During the isolation of DNA, the addition of which of the following causes the precipitation of purified DNA?

A. Chilled ethanol

B. Ribonuclease enzyme

C. DNA polymerase

D. Proteases

Answer: A

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33. Which of the following is the correct sequence of PCR (polymerase chain reaction)?

A. Denaturation < Annealing < Extension

B. Extension < Denaturation < Annealing

C. Annealing < Extension < Denaturation

D. Denaturation < Extension < Annealing

Answer: A

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34. The most commonly used bioreactor is of stirring type. The stirrer facilitates

A. Temperature control

B. pH control

C. Oxygen availability

D. Product removal

Answer: C

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35. After completion of biosynthetic stage, the separation and purification of product is called :

A. Upstream processing

B. Downstream processing

C. Modern biotechnology

D. Gene amplification

Answer: B

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36. From isolated DNA from a cell culture with seven desire3d genes, DNA segment can be excised by molecular scissors or chemical scalpels what biotechnologists call as

A. Polymerase enzymes

B. DNA ligase

C. Restriction enzymes

D. Helicase

Answer: C

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37. All the following statements about Stanley Cohen and Herbert Boyer are correct but one is wrong. Which one is wrong

A. They discovered recombinant DNA (rDNA) technology, and this marks the birth of modern biotechnology.

B. They first produced healthy sheep clone, a Finn Dorset lamb, Dolly, from the differentiated adult mammary cells.

C. They invented genetic engineering by combining a piece of foreign DNA containing a gene from a bacterium with

a bacterial plasmid using the enzyme restriction endonuclease.

D. They isolated the antibiotic resistance gene by cutting out a piece of DNA from the pasmid which was responsible for conferring antibiotic resistance.

Answer: B

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38. What is the fate of a piece of DNA which is somehow transferred into an alien organism?

A. This piece of DNA would not be able to multiply itself in the progeny cells of the organism if not intergrated into the genome of the oganism.

B. If the alien piece of DNA has become a part of the chromosome, it will replicate.

C. If the alien piece of DNA is linked with the origin of replication in chromosome, it will replicate.

D. All of these

Answer: D

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39. In the year 1963 , the two enzymes responsible for restricting the growth of

bacteriophage in Escherichia coli were isolated . They were respectively

A. Ligase, restriction endonuclease

B. Helicase, restriction endonuclease

C. Methylase, restriction endonuclease

D. DNA polymerase, restriction endonuclease

Answer: C

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40. The cutting of DNA by restriction endonucleases results in fragments of DNA. These fragments are generally separated by a technique known as

A. Gel- filtration chromatography

B. Centrifugation

C. Gel electrophoresis

D. Thin-layer chromatography

Answer: C

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41. Which of the following bacteria are known as natural genetic engineers of plants, as gene transfer is happening in nature without human interference?

A. Azotobacter

B. Agrobacterium tumefaciens

C. Escherichia coli

D. Rhizobium

Answer: B

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42. The technique in which foregin DNA is precipitated over surface of metal particles for passing into target cells is

A. Microinjection

B. Chemical-mediated genetic transformation

C. Electroporation

D. Biolistics

Answer: D

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43. Isolation of the genetic material in pure form, free from other macromolecules can be achieved by treating the bacterial cells/plant or animal tissues with the following enzymes, except

A. Lysozyme

B. Cellulase

C. Chitinase

D. Ligase

Answer: D

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44. Which of the following is not a recombinant protein used in medical practice ?

A. TPA (tissue plasminogen activator)

B. Interferon (α,β, and γ)

C. Vaccine (for hepatitis B)

D. Heparin

Answer: D

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45. cDNA is

A. Circular DNA in bacteria

B. Complementary DNA

C. Copy DNA

D. Both (2) and (3)

Answer: D

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46. Noble prize of 1978 for restriction endonuclease technology was given to :

A. Temin and Baltimore

B. Milstein and Kohler

C. Arber, Nathans, and Smith

D. Holley, Khorana, and Nirenberg

Answer: C

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47. Plasmids are used in genetic engineering because they

A. are easily available

B. are able to integrate with host chromosome

C. are able to replicate along with chromosomal DNA

D. contain DNA sequence coding for drug resistance

Answer: C

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48. Which of the following processes and techniques are included under biotechnology?

A. Silencing of the gene to deveop pestresistant plants.

B. Synthesizing gene and using it.

C. Developing a DNA vaccine.

D. Correcting a defective gene.

A. (B) and (D) only

B. (B),(C), and (D)

C. (A) and (B)

D. (A),(B) ,(C) and (D)

Answer: D

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49. The tumour -inducing (Ti) plasmid has now been modified into a cloning vector which is no more pathogenic to the plants but is still able to use the mechanisms to deliver genes of our interest into a variety of plants because Ti plasmid has been modified by

A. Adding tumor-forming genes

B. Deleting tumor-forming genes

C. Adding genes resistant to endonucleases

D. Deleting endonuclease

Answer: B

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50. Which of the following statements is incorrect?

A. Plasmids have the ability to replicate within the bacterial cells independent of the control of chromosomal DNA.

B. Some plasmids have only one or two copies per cell whereas others may have 15-100 copies per cell.

C. Bacteriophages have the ability to replicate within the bacterial cell independent of the control of chromosomal DNA.

D. Transformation is a procedure of separation and isolation of DNA fragments.

Answer: D

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51. Which of the following is the first artificial cloning vector that has two selectable markers —tetracycline (tetR) and antibiotic restriction enzymes (ampR)?

A. YAC

B. BAC

C. pBR322

D. Cosmid vectors

Answer: C

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52. Restriction endonucleases are most widely used in recombinant DNA technology. They are obtained from

A. Bacteriophase

B. Bacterial cells

C. Plasmids

D. All prokaryotic cells

Answer: B

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53. All the following statements are correct about genetic engineering, but one is wrong. Which one is wrong?

A. It is a technique for artificially and deliberately modifying DNA (genes) to suit human needs.

B. It is often referred as gene splicing.

C. The organism carrying the foreign genes is termed as transgenic or GMO.

D. Alec Jeffrey is the father of genetic engineering.

Answer: D

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54. All the following are the properties of the enzyme t aq polymerase except:

A. It is thermostable DNA polymerase

B. It is isolated from a bacterium, Thermus aquaticus

C. It is used for the amplification of gene of interest using PCR

D. It is thermostable RNA polymerase

Answer: D

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55. Which of the following is incorrect match?

A. Gene therapy : An abnormal gene is replaced by normal gene

B. Cloning : Ability to multiply copies of antibiotic resistance gene in E. coli

C. Restriction enzymes : Molecular scissors

D. Exonucleases : Molecular glue

Answer: D

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56. Appropriate techniques have been developed for large scale cell culture using bioreactors for producing :

A. Foreign gene product

B. Vaccines

C. Hormones

D. All of these

Answer: D

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57. The uptake of genes by cells in microbes and plants is termed as

A. Insertional inactivation

B. Transformation

C. Selectable markers

D. Cloning vectors

Answer: B

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58. If we ligate a foreign, DNA at the Barn HI site of tetracycline resistance gene in pBR322 the recombinant plasmid u ill:

A. Show ampicillin resistance only

B. Show tetracycline resistance

C. Will grow well on tetracycline-containing medium

D. Will not grow on ampicillin-containing medium

Answer: A

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59. Polyethylene glycol can help in the uptake of foreign DNA into the host cell, this type of gene transfer is called as:

A. Electroporation

B. Chemical-mediated genetic transformation

C. Microinjection

D. Particle gun

Answer: B

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60. The normal E. coli cells carry resistance against which of the following antibiotics?

A. Ampicillin

B. Chloramphenicol

C. Tetracycline or kanamycin

D. None of these

Answer: D

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61. The isolation of the genetic material from fungal cells does not involve the use of

A. Agarose

B. Chitinase

C. Ethanol

D. Water

Answer: A

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62. In a restriction digestion experiment, the sticky ends of vector rejoined forming a circular vector without insert. Which enzyme can be used to eliminate this possibility?

A. DNA ligase

B. Alkaline phosphatase

C. DNA polymerase

D. RNA polymerase

Answer: B

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63. Denaturation can be achieved at which temperature during PCR?

A. $72^{\circ} C$

B. $95^{\circ} C$

C. $40^{\circ} C$

D. $25^{\circ} C$

Answer: B

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64. Choose the incorrect statement with respect to Agrobacterium tumefaciens.

A. It is a Gram-negative soil bacterium.

B. It produces crown gall disease in dicot plants.

C. The foreign DNA is inserted at the ori site of Ti plasmid.

D. Ti plasmid becomes incorporated into the plant chromosomal DNA.

Answer: C

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65. Which is not a method for the introduction of recombinant DNA into host cells?

A. Electroporation

B. Biolistics

C. Transfection

D. Restriction digestion

Answer: D

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66. The essential requirements for a gene amplification reaction are

A. 20 mg of DNA template

B. Forward and reverse primers

C. Mg^{2+}

D. All of these

Answer: D

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67. Choose the incorrect statement with respect to PCR reaction:

A. It requires Taq polymerase.

B. It requires dNTP's.

C. It generates 2nmolecules after nnumber of cycles.

D. The optimum temperature for polymerization step is greater than or equal to $90^{\circ} C$.

Answer: D

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68. Which is not an application of PCR?

A. DNA fingerprinting

B. DNA foot-printing

C. Detection of mutation

D. Prenatal diagnosis

Answer: B

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69. Rejoining of vector molecule after restriction enzyme digestion can be avoided by

A. Using different enzymes for insert and vector

B. Using same enzyme for insert and vector

C. Using DNA ligase immediately after digestion

D. Using alkaline phosphatase on only vector

Answer: D

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70. Gene of interest was cloned at site Sal I in Pbr322. The recombinant plasmid will exhibit susceptibilty to

A. Ampicillin

B. Tetracyline

C. Both (1) and (2)

D. Kanamycin

Answer: A

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71. It is theoretically possible for a gene grom any organism to function in any other organism. Why is this possible ?

A. All organisms have ribbosomes.

B. All orgainsms have the same genetic code.

C. All organisms are made up of cells.

D. All organisms have similar nuclei.

Answer: B

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72. If you discovered a bacterial cell that contained no restriction enzymes, which of the following would you except to happen ?

A. The cell would create incomplete plasmids.

B. The cell would be unable to replicate is DNA.

C. The cell would become an obligate parasite.

D. The cell would be easily infected bacteriophages.

Answer: D

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73. Assume that you are trying to insert a gene into a plasmid and someone gives you a preparation of DNA cut with restriction enzyme X. The gene you wish to insert has sites on both ends for cutting by restriction

enzyme Y. You have a plasmid with a single site for Y, but not for X. Your strategy should be to

A. Cut the plasmid with restriction enzyme X and inert the fragments cut with Y into the plasmid

B. Cut the plasmid with restriction enzyme X and insert the gene into the plasmid

C. Cut the plasmid twice with restriction enzyme Y and ligate the two fragments

into the plasmid cut with the same enzyme

D. Cut the plasmid twice with restriction enzyme Y and ligate the two fragments onto the ends of the human DNA fragments cut with restriction enzyme X

Answer: C

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74. I. Transform bacteria with recombinant DNA molecule.

II. Cut the plasmid DNA using restriction enzymes.

III. Extract plasmid DNA from bacteria cells.

IV. Hydrogen-bond the plasmid DNA to non-plasmid DNA fragments.

V. Use ligate to seal plasmid DNA to non-plasmid DNA.

From the given list, which of the following is the most logical sequence of steps for splicing

foregain DNA into a plasmid and inserting the plasmid into a bacterium ?

A. IV,V,I,II,III

B. III,II,IV,V,I

C. III,IV,V,I,II

D. II,III,V,IV,I

Answer: B

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75. An eukaryotic gene has sticky ends produced by restriction endonuclease Eco Ri. The gene is added to a mixture containing Eco RI and a bacterial plasmid that carries two genes, which make it resistant to ampicillin and tetracyline. The plasmid has one recongition site for Eco RI located in the tetracycline resistance gene. This mixture is incubated for several hours and then added to bacteria growing in nutrient broth. The bacteria are allowed to grow overnight and are streaked on a, plate using a techgrow

overnight and are streaked on a plate using technique which produces isolated colonies that are clones of the original. Samples of these colonies are then grown in four different media : nutrient broth plus ampicillin, nutrient broth plus tetracycle, nutrient broth plus ampicillin and tetracycline, and nutrient broth contianing no antibiotics. The becteria containing the engineered plasmid would grow in

A. The ampicillin and tetracycline broth only

B. The nutrient broth, the ampicillin broth, and the tetracycline broth

C. The nutrient broth and the amplicillin broth only

D. The nutrient broth only

Answer: C

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76. Agrobacterium tumefaciens used in Genetic engineering for

A. DNA mapping

B. DNA modification

C. Vector

D. DNA fingerprinting

Answer: C

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

A. Escherischia coli

B. Bacillus subtilis

C. Agrobacterium tumefaciens

D. Pseudomonas putida

Answer: D

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78. Who isolated the first restriction endonucleases :

A. Temin and Baltimore

B. Sanger

C. Nathan and Smith

D. Paul Berg

Answer: C

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79. Genetic engineering is

A. Study of extra-nuclear gene

B. Manipulation of genes by articial method

C. Manipulation of RNA

D. Manipulation of enzymes

Answer: B

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80. Which of the following enzymes cut the DNA molecule at specific nucleotide sequence ?

A. Restriction endouclease

B. DNA ligase

C. RNA polymerase

D. Exonuclease

Answer: A

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81. DNA fingerprinting was invented by

A. Kary Mullis

B. Alec Jeffery

C. Dr. Paul Berg

D. Francis Collins

Answer: B

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82. Which structure involved in genetic engineering

A. Plastid

B. Plasmid

C. Codon

D. None

Answer: B

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

A. Eco RI

B. Hind III

C. Bam I

D. All of the above

Answer: D

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84. Restriction endonucleases are used in genetic engineering because :

A. They can degrade harmful proteins

B. They cn join DNA fragments

C. They can cut DNA at Variable sites

D. They can cut DNA at specific base sequences

Answer: D

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

A. cDNA

B. DNA prode

C. Sticky end

D. Blunt end

Answer: B

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87. Which of the following is the example of direct gene transger:

A. Microinjection

B. Electroporation

C. Particle gun

D. All the above

Answer: D

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88. How many copies of DNA sample are poduced in PCR technique after 6-cycle

A. 4

B. 32

C. 16

D. 64

Answer: C

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89. Western blotting is used for the identification of :-

A. DNA

B. RNA

C. Proein

D. All of the above

Answer: C

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90. 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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91. Which of the following techniques are used in analyzing restrication fragment length polymorphism (RFLP) :-

Electrophoresis

Electroporation

Methylation

Restrication digestion

A. (a) and (c)

B. (c) and (d)

C. (a) and (d)

D. (b) and (d)

Answer: C

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92. Restriction enzymes are :

A. Not always required in genetic engineering

B. Essential tool in genetic ebgineering

C. Nucleases that cleave DNA at specific sites

D. Both (2) and (3)

Answer: D

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93. Function of restriction endonuclease enzyme is

A. It is useful in genetic engineering

B. It protects the bacterial DNA against foreign DNA

C. It is helpful in transcription

D. It is helpful in protein synthesis

Answer: B

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94. Which of the followoing restriction endonuclease enzyme produce blunt end in DNA :

A. Bam HI $\begin{array}{cccccc} \downarrow & & & & & \\ G & G & A & T & C & C \\ C & C & T & A & G & G \\ & & & & \uparrow & \end{array}$

B. Eco RI $\begin{array}{cccccc} & \downarrow & & & & \\ G & A & A & T & T & C \\ C & T & T & A & A & G \\ & & & & \uparrow & \end{array}$

C. Hae III $\begin{array}{cccc} & & \downarrow & \\ G & G & C & C \\ C & C & G & G \\ & & \uparrow & \end{array}$

D. All the above

Answer: C

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95. 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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96. Restriction enzymes

A. Are endonucleases which cleave DNA at specific sites

B. MakeDNA complementary to an existingDNA or RNA

C. Cut or join DNA fragments

D. Are required in vector-less direct gene transfer

Answer: A

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97. What is the first step in the Southern Blot technique

A. Denaturation of DNA on the gel for hybridization with specific probe.

B. Production of a group of genetically identical cells.

C. Digestion of DNA by restriction enzyme.

D. Isolation of DNA from a nucleated cell such as the one from the scene of crime.

Answer: A

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98. Which of the following is produced by E-Coli in the lactose operon.

A. $B\eta$-galactosidase

B. Thiogalactoside transacetylase

C. Lactose dehydrogenase

D. Lactose permease

Answer: C

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99. The technique of transferring DNA fargment separated on agarose gel to a synthetic membrane such as nitrocellulose is known as

A. Northern blotting

B. Southern blotting

C. Western blotting

D. Dot blotting

Answer: B

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100. 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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101. The total number of nitrogenous bases in human genome is estimated to be about

A. 3.5 million

B. 35 thousand

C. 35 million

D. 3.1 billion

Answer: D

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102. The restriction enzyem 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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103. 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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104. More advancement in genetic engineering is due to

A. Restriction endonuclease

B. Reverse transcriptase

C. Protease

D. Zymase

Answer: A

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105. 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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106. Which of the following is used as a best genetic vector in plants?

A. Bacillus thuriengenesis

B. Agrobacterium tumefaciens

C. Pseudomonas putida

D. All of these

Answer: B

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107. The transfer of protein from electophoretic gel to nitrocellulose membrane is known as

A. Transferase

B. Northern blotting

C. Western blotting

D. Southern blotting

Answer: C

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108. DNA fingerprinting was first discovered by

A. Alec Jeffery

B. Cark Mullis

C. C.Milstein

D. Dr. Paul Berg

Answer: A

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109. 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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110. Plasmid has been used as vector because

A. It is circular DNA which has capacity to join 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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111. Which of the following cuts the DNA from specific places :

A. Restriction endonuclease (Eco RI)

B. Ligase

C. Exonuclease

D. Alkaline phosphate

Answer: A

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

A. Restriction endonuclease

B. DNA ligase

C. Transcriptase

D. Primase

Answer: A

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113. DNA fingerprinting refers to

A. Techniques used for the identification of fingerprints of individuals

B. Molecular analysis of profiles of DNA samples

C. Analysis of DNA samples using imprinting devices

D. Techniques used for molecular analysis of different specimens of DNA

Answer: D

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114. Restriction endonucleases :

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

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 in vitro DNA sythesis

Answer: A

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

A. Bacterial cell can carry out RNA splicing reactions

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

C. human chromosome can replicate in bacterial cell

D. Genetic code is universal

Answer: D

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

A. Escherischia coli and Agrobacterium tumefaciens

B. Vibro cholerae and a tailed bacteriophage

C. Diplococcus sp. And Pseudomonas sp.

D. Crown gall bacterium and Caenorhabdits elegans

Answer: A

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117. 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. Synthesis DNA

Answer: B

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118. Satellite DNA is useful tool in

A. Organ transplantation

B. Sex determination

C. Forensic science

D. Genetic engineering

Answer: C

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119. A: DNA ligase plays an important role in recombinant DNA technology.

R: The linking of antibiotic resistance gene with plasmid vector became possible by enzyme DNA ligase

A. If both Assertion and Reason are true and the reason is the correct

explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: A

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120. A: Restriction enzymes belong to a larger class of enzymes called nucleases.

R: Each restriction enzymes recognises sequence in the DNA.

A. If both Assertion and Reason are true and the reason is the correct

explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: B

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121. A: During gel electrophoresis, the DNA fragments move towards the anode.

R: DNA fragments are negatively charged molecules .

A. If both Assertion and Reason are true and the reason is the correct

explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: A

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122. A: Selection of recombinants due to inactivation of antibiotics is cumbersome procedure.

R: It requires simultaneous plating on two plates having different antibiotics.

A. If both Assertion and Reason are true and the reason is the correct

explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: A

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123. A: Taq Polymerase is involved in PCR technique.

R: This enzyme remain active during the high temperature including denaturation of double stranded DNA.

A. If both Assertion and Reason are true and the reason is the correct

explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: A

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124. Assertion : Small DNA fragments will arrange towards the positive end after gel electrophoresis in DNA test.

Reason : DNA is negative charged.

A. If both Assertion and Reason are true and the reason is the correct

explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: A

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125. Taq polymerase enzyme is used in

A. If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion and Reason are true but the reason is not the correct explanation of the assertion then mark (2).

C. If Assertion is true but Reason are false, then mark(3).

D. If both Assertion and Reason are false, then mark(4).

Answer: C

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Archives Choose The Correct Option

1. The linking of antibiotic resistance gene with the plasmid vector became possible with

A. DNA polymerase

B. Exonucleases

C. DNA ligase

D. Endonucleases

Answer: C

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2. Gel electrophoresis is used for

A. construction of recombinant DNA by joining with cloning vectors

B. isolation of DNA molecule

C. cutting of DNA into fragments

D. separation of DNA fragments according to their size

Answer: D

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3. 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

4. Restriction endonucleases are enzymes which

A. Make cuts at specific positions within the DNA molecule

B. Recognize a specific nucleotide sequence for binding of DNA ligase

C. Restrict the action of enzyme DNA polymerase

D. Remove nucleotides from the ends of the DNA molecule.

Answer: A

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

A. Vector

B. Probe

C. Clone

D. Plasmid

Answer: B

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

A. 5'____CGT TCG_____3'

3'_____ATG GTA_____5'

B. 5'_____GATATG_____3'

3'_____CTACTA_____5'

C. 5'_____GA AT TC_____3'

3'_____CT TA AG_____5'

D. 5'_____CACGTA_____3'

3'_____CTCAGT_____5'

Answer: C

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

A. Baculovirus

B. Samonella typhimurium

C. Rhizopusnigricans

D. Retrovirus

Answer: D

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8. Agarose extracted from sea weeds finds use in

A. Gel electrophoresis

B. Spectrophotometry

C. Tissue Culture

D. PCR

Answer: A

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9. There is a restriction endonuclease called Eco RI. What does 'co' part in it stand for ?

A. coli

B. colon

C. coelon

D. coenzyme

Answer: A

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10. PCR and restriction Fragements length Polymorphism are the methods for

A. Genetic transformation

B. DNA sequencing

C. Genetic fingerprinting

D. Studyof enzymes

Answer: C

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

A. It is serves as a selectable marker.

B. It is isolated from a virus.

C. It remains active at high temperature .

D. It is used to ligate introduced DNA in recipient cells.

Answer: C

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12. For transformation, micro- particales coated with DNA to be bombarded with ghene gun are made up of

A. Platinum or zinc

B. Silicon or platinum

C. Gold or tungsten

D. Silver or platinum

Answer: C

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13. A single strand of nucleic acid tagged with a radioactive molecule is called:

A. Selectable marker

B. Plasmid

C. Probe

D. Vector

Answer: C

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14. which one of the following is a case of wrong matching?

A. Vector DNA : Site for tRNA sythesis

B. Micropropagation :In vitro production of plants in large numbers

C. Callus: Unorganized mass of cells produced in tissue culture

D. Somatic hybridization : Fusion of two diverse cells

Answer: A

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15. Biolistics (gene-gun) is suitable for

A. Disarming pathogen vectors

B. Transformation of plant cells

C. Constructing recombinant DNA by joining with vectors

D. DNA fingerprinting

Answer: B

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16. In genetic engineering, the antibiotics are used

A. As selectable markers

B. To select healthy vectors

C. As sequences from where replication starts

D. To keep the cultures free of infection

Answer: A

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17. What is it that forms the basis of DNA Fingerprinting

A. The relative proportions of purines and pyrimidines in DNA.

B. The relative difference in the DNA occurrence in blood, skin, and saliva.

C. The relative amount of DNA in the ridges and grooves of fingerprints.

D. Satellite DNA occurring as highly repeated short DNA segments.

Answer: D

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

A. 5'-GA AT TC-3',3'-CT TA AG-5'

B. 5'-C CATC C-3',3'-GA ATC C-5'

C. 5'-CAT TAG-3',3'-GATA AC-5'

D. 5'-GATAC C-3',3'-C CTA AG-5'

Answer: A

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

A. Polymerase chain reaction

B. Electrophoresis

C. Restriction mapping

D. Centrifugation

Answer: B

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

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

B. Insertional inactivation of alpha-galactosidase in recombinant bacteria

C. Inactivation of glycosidase enzyme in recombinant bacteria

D. Non-recombinant bacteria containing beta-galactosidase

Answer: B

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21. 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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22. In vitro clonal propagation in plants is characterized by

A. PCR and RAPD

B. Northern blotting

C. Electrophoresis and HPLC

D. Microscopy

Answer: A

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23. 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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24. 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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25. Which of the following is not a feature of the plasmids

A. Independent replication

B. Circular structure

C. Transferable

D. Single-stranded

Answer: D

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26. The taq polymerase enzyme is obtained from

A. Thermus aquaticus

B. Thiobacillus ferroxidans

C. Bacillus subtills

D. Pseudomonas putida

Answer: A

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27. Which of the following is a restriction endonuclease ?

A. Hind II

B. Protease

C. Dnase I

D. Rnase

Answer: A

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28. Stirred-tank bioreactors have been designed for

A. availability of oxygen thoughout the process

B. ensuring anaerobic conditions in the culture vessel

C. purification of product

D. addition of preservatives to the product

Answer: A

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29. A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using

A. Polymerase-III

B. Ligase

C. Eco RI

D. Taq polymerase

Answer: B

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30. Which of the following is not a component of down stream processing ?

A. Preservation

B. Expression

C. Separation

D. Purification

Answer: B

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31. Which of the following restriction enzymes produces blunt ends

A. Xho I

B. Hind III

C. Sal I

D. Eco RV

Answer: D

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