1. Gel electrophoresis is used for **(2008)**

(A)Construction of recombinant DNA by joining with cloning vectors

(B)Isolation of DNA molecules

(C)Cutting of DNA into fragments

(D) Separation of DNA fragments according to their

2. Bacterium commonly used in plant genetic engineering is **(2009)**

(A)*Agrobacterium* (B)*Corynebacterium*

(C)*Bacillus subtilis* (D)*Salmonella typhi*

3. Which is used in gene cloning?

(A)Lamosomes (B)Mesosomes

(C) Plasmids (D)Nucleotides

4. Which can be used as vector for transfer of DNA segment? **(2010)**

(a)bacterium (b)plasmid

(c)plasmodium (d)bacteriophage

(A)a, b and d (B)a only

(C)a and c **(D)**b and d

5. Which one of the following is used as vector for cloning into higher organisms? **(2010)**

(A)*Salmonella typhimurium* (B)*Rhizopus nigricans*

(C) Retrovirus (D)Baculovirus

6. Stirred-tank bioreactors have been designed for **(2010**)

(A)Purification of the product

(B)Ensuring anaerobic conditions in the culture vessel

(C) Availability of oxygen throughout the process

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(D)Addition of preservatives to the product.

7. There is a restriction endonuclease called EcorI. What does 'co' part of it stand for? **(2011)**

(A)Coenzyme **(B)*coli***

(C)Colon (D)Coelom

8. Agarose extracted from sea weeds finds use in **(2011)**

(A)PCR **(B)**Gel electrophoresis

(C)Spectrophotometry (D)Tissue culture

9. Which technique made it possible to genetically engineer living organ isms? **(2011)**

(A) Recombinant DNA techniques

(B)Heavy isotope labeling

(C)X-ray diffraction

(D)Hybridisation

10. What is the source of EcoRI?

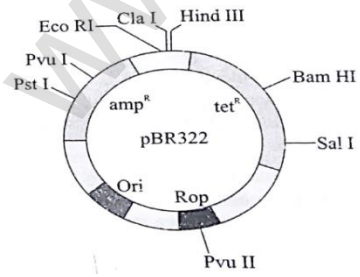
(A)*Excherichia coli* RI

(B)*Escherichia coli* RI 13

(C)*Escherichia coli* RX 13

(D)*Escherichia coli* RX 13

11. In the diagram of pBR 322, which identifies components correctly **(2012)**



(A)rop—reduced osmotic pressure

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(B)Hind III, EcoRI—selectable markers

(C)ampR, tetR—antibiotic resistance genes

(D)ori—original restriction enzyme

12. What is true about DNA polymerase used in PCR? **(2012)**

(A)It is used to ligate introduced DNA in recipient cells

(B)It serves as selectable marker

(C)It is isolated from a virus

(D) It is active at high temperature

13. Microparticles for coating with DNA to be bombarded with gene gun are made of **(2012)**

(A)Silver or platinum

(B)Platinum or zinc

(C)Silicon or platinum

(D) Gold or tungsten

14. Biolistic gun is suitable for **(2012)**

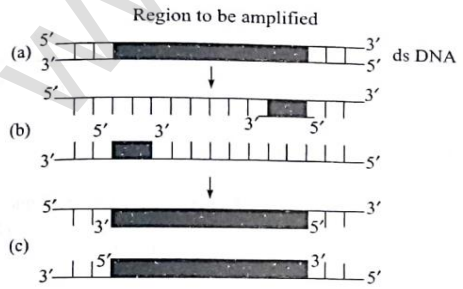
(A) Transformation of plant cells

(B)Disarming pathogen vectors

(C)DNA finger printing

(D)Constructing recombinant DNA

15. In the three steps (a, b, c) of polymerase chain reaction, select the correct step. **2012)**



(A)c—extension in presence of heat stable DNA polymerase

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(B)a—annealing with two sets of primers

(C)b—denaturation at high temperature

(D)a—denaturation at 50°C

16. In genetic engineering antibiotics are used (**2012)**

(A)For keeping cultures free of infection

(B)To select healthy vectors

(C) As selectable markers

(D)As sequence where replication starts

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

(A)Industrial inactivation of alpha galactosidase in recombinant bacteria

(B)Inactivation of glycosidase enzyme in recombinant bacteria

(C) Non-recombinant bacteria containing beta galactosidase

(D)Insertional inactivation of alpha galactosidase in non-recombinant bacteria

18. DNA fragements generated by the restriction endonucleases in a chemical reaction can be separated by **(2013**)

(A) Electrophoreisi

(B)Restriction mapping

(C)Centrifugation

(D)Polymerase chain reaction

19. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme? **(2013)**

(A) Algae—Methylase

(B)Fungi—Chitinase

(C)Bacteria—Lysozyme

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(D)Plant cells—Cellulase

20. *Eco* RI cleaves the DNA strands to produce **(2013)**

(A)Blunt ends **(B)**Sticky ends

(C)Satellite ends (D)*ori* replication end

21. During the process of isolation of DNA, chilled ehtanol is added to **(2013)**

(A) Precipitate DNA

(B)Break open the cell to release DNA

(C)Facilitate action of restriction enzymes

(D)Remove proteins such as histones

22. During amplification of gene using PCR, *Taq* polymerase is used between **(2013)**

(A)Denaturation and annealing

(B) Annealing and extension

(C)Annealing and amplification

(D)None of above

23. Which of the following is a cloning vector?

(A)DNA of *Salmoneall atyphimurium*

(B)*Ti* plasmid

(C)Any DNA containing antibiotic resistance genes

(D)*Ori* minus pBR 322

24. Which of the following is a palindromic sequence? **(2013)**

(A)5′ —CGTATG—3′ (B)5′—CGAATG—3′

3′—GCATAC—5′ 3′—CGAATG—5′

(C) 5′ —GAATTC—3′ (B)5′—GACTAC—3′

3′—CTTAAG—5′ 3′—TACGAC—5′

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25. The restriction enzymes are used in genetic engineering, because **(2013)**

(A) They can cut DNA at specific base sequence

(B)They are nucleases that cut DNA at variable sites

(C)They can degrade harmful proteins

(D)They can degrade harmful fragments

26. Which vector can clone only a small fragment of DNA? **(2014**)

(A)Cosmid

(B)Baterial artifical chromosome

(C)Yeast artifical chromosome

(D) Plasmid

27. The terms 'microinjection', 'biolistics' and 'disarmed pathogen vector' are related to **(2015)**

(A)Bioterrorism

(B)Biosaftey

(C)Integrated pest management

(D) Integrated pest management

28. Recombinant-DNA technology revolution actually began with the discovery of **(2015)**

(A)Plasmids

(B) Restrictin endonucleases

(C)Complementary DNA

(D)PCR

29. Bioreactor is a vessel/device in which **(2015)**

(A) Chemical process involving microorganisms is carried out

(B)Chemical process involving radioactive substance is carried out

(C)Potentially hazardous microbes are handled

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(D)Electrochemical processes are carried out

30. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme? **(2015)**

(A)Plant cells—Cellulase

(B) Algae—Methylase

(C)Fungi—Chitinase

(D)Bacteria—Lysozyme

31. Restriction enzymes are used in genetic engineering because **(2015)**

(A)They can join different DNA fragments

(B) They can cleave DNA at a specific target

(C)They are nucleases that cut DNA at variable sites

(D)They are proteolytic enzymes which can degrade harmful enzymes

32. The toxic protein produced by the *Bacillus thuringiensis* **(2015)**

(A) Cry-protein (B)Auxins

(C)Leg—haemoglobin (D)Opines

33. The DNA molecule to which the gene of interest is integrated for cloning is called **(2015)**

(A) Vector (B)Template

(C)Carrier (D)Transformer

34. The introducing of T-DNA into plants involves **(2015)**

(A)Altering the pH of the soil, then heat-shocking the plants

(B)Exposing the plants to cold for a brief period

(C)Allowing the plant roots to stand in water

(D) Infection of the plant by *Agrobacterium tumefaciens.*

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35. The cutting of DNA at specific locations became possible with the discovery of **(2015)**

(A)Probes (B)Selectable markers

(C)Ligases **(D)**Restriction enzymes.

36. Isolation of DNA from a fungal cell involves the use of enzyme **(2016)**

(A) Chitinase (B)Lysozyme

(C)Eco RI (D)Hind-II

37. Which of the following is not a feature of the plasmids? **(2016)**

(A)Transferable

(B) Single-stranded

(C)Independent replications

(D)Circular structure

38. Which of the following is a restriction endonuclease? **(2016)**

(A)DNase I (B)RNase

(C) Hind II (D)Protease

SECTION D: CHAPTER-END TEST

1. Plasmids are vectors for gene cloning because they

(A) Self replicate in bacterial cells

(B)Replicate freely outside bacterial cells

(C)Can be multiplied in culture

(D)Can be multiplied in laboratories using enzymes

2. Cloning is means of

(A)Replace original genotype

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(B) Preserve genotype

(C)Production of HGH gene in *Escherichia coli*

(D)None of the above

3. Two bacteria most useful in genetic engineering are

(A)*Rhizobium* and *Azotobacter*

(B)*Escherichia* and *Agrobacterium*

(C)*Rhizobium* and *Diplococcus*

(D)*Nitrosomonas* and *Klebsiella*

4. Bacterial plasmid contains

(A)RNA

(B)RNA + protein

(C)DNA

(D)Photosynthetic structures

5. A good vector in genetic engineering is

(A)*Agrobacterium tumefaciens*

(B)*Bacillus thuringiensis*

(C)*Bacillus amyloliquefaciens*

(D)*Salmonella typhimurium*

6. The technique of insertion of a desired gene into DNA of plasmid vector is

(A) Gene splicing (B)Gene dressing

(C)Gene cloning (D)Gene drafting

7. A plasmid

(A)Lives together with chromosomes

(B)Shows dependent assortment

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(C) Can replicate independently

(D)Cannot replicate

8. With the help of DNA ligase donor DNA fragment is joined. It is called

(A)Molecular cloning (B)Tissue culture

(C)Protoplasmic fusion **(D)**Splicing

9. Advancement i genetic engineering has been possible due to discovery of

(A)Transposons **(B)**Endonucleases

(C)Exonucleases (D)Oncogenes

10. Restriction endonucleases are useful in

(A)Breaking DNA at specific sites

(B)Creating sticky ends

(C)Both A and B

(D) Crossing over

11. Endonuclease is employed in

(A)Transcription (B)Translation

(C) Genetic engineering (D)DNA replication

12. The enzymes which are commonly used in genetic engineering are

(A)Restriction endonuclease and polymerase

(B)Endonuclease and ligase

(C) Restriction endonuclease and ligase

(D)Ligase and polymerase

13. Natural genetic engineer is

(A)*Pseudomonas putida*

(B)*Agrobacterium tumefaciens*

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(C)*Escherichia coli*

(D)*Bacillus subilis*

14. Genomic DNA library is

(A) Pacing of donor DNA is a collection of vectors

(B)A collection of gene vectors

(C)Collection of organsims for extracting DNA

(D)A collection of literature about DNA

15. Bacteria protect themselves from viruses by fragmenting viral DNA with

(A) Endonuclease (B)Exonuclease

(C)Gyrase (D)Ligase

16. In plant biotechnology, root tumours are induced by

(A)*Rhizobium*

(B)*Agrobacterium tumefaciens*

(C)*Agrobacterium rhizogenes*

(D)*Agrobacterium basilis*

17. Restriction endonucleases are called so as they

(A)Synthesize DNA

(B)Restrict nuclear activity

(C) Cleave DNA into fragments

(D)Breadk DNA at random

18. Select DNA sequence which could act as a restriction site.

(A)$\frac{\text{AACCGG}}{\text{TTGGCC}}$ (B)$\frac{\text{GGTTGG}}{\text{CCTTGG}}$

(C) $\frac{\text{AAGGCT}}{\text{TTCCGA}}$ **(D)** $\frac{\text{CTGCAG}}{\text{GACGTC}}$

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19. Extracthromosomal DNA used as vector in gene cloning is

(A)Transposon (B)Intron

(C)Exon **(D)**Plasmid

20. Electroporation is

(A) Making trasient pores in cell membranes to introduce gene constructs

(B)Fast passage of nutrients through phloem sieve pores by elecytric stimulation

(C)Opening of stomata by artifical light during night

(D)Purification of saline water with the help of membrane system

21. Which enzyme is useful in genetic engineering?

(A)DNase

(B)Amylase

(C)Lipase

(D) Restriction endonuclease

22. Restriction enzymes are used in genetic engineering because they

(A)Can join DNA fragments

(B) Cut DNA at specific base sequence

(C)Cut DNA at variable was

(D)Are proteolytic enzymes which degrade harmful proteins

23. Insect tolerant gene from *Bacillus thuringiensis* is introduced using Ti plasmid of

(A)*Escherichia coli*

(B)*Agrobacterium tumefaciens*

(C)*Haemophilus influenzae*

(D)*Arabidopsis thaliana*

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24. GAATTC is recognition site of restriction endonuclease

(A)Hind –III **(B)**EcoR-I

(C)Bam-I (D)Hae-III

25. Restriction endonuclease is employed for cutting

(A)A single stranded DNA

(B) Double stranded DNA

(C)RNA fragment

(D)mRNA

26. Restriction enzyme (s) of recombinant DNA technology that make staggered cuts leavin sticky ends is/are

(A)EcoR-I (B)Hind-II

(C)Bam HI **(D)**All the above

27. Cohen and Boyer isolated an antibiotic resistance gene by cutting out a piece of DNA from a plasmid having antibotic resistance in the year

(A)1963 (B)1967

(C)1972 (D)1982

28. Amplification of gene of interest by using PCR may go up to

(A)0.1 million (B)1.0 million

(C)10. billion (D)1.0 trillion

29. Enzymes necessary for recombinant DNA technology are

(A)Endonucleases and polymerases

(B) Restriction endonucleases and ligases

(C)Peptidases and ligases

(D)Restriction endonucleases and topoisomerases

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30. Read a and b and identify correct choice

a.*Agrobacterium tumefaciens* causes crown gall in dicots Statement

b.*Agrobacterium tumefaciens* enters host through wound and injuries

(A)b is correct, a is wrong

(B) Both a and b are correct

(C)Both a and b are wrong

(D)a is correct, b are wrong

31. In genetic engineering, restriction enzymes are used for cutting

(A)Bacterial DNA only (B)Eukaryortic DNA

(C)Vrial DNA **(D)**Any DNA fragment

32. Melting of DNA at 70℃ is due to breakdown of

(A)Phosphodiester bonds **(B)**Hydrogen bonds

(C)Glycosidic bonds (D)Disulphide bonds

33. Fragments of DNA formed after treatment with endonucleases are separated by the technique

(A)Polymerase chain reaction

(B)Souther blotting

(C)Colony hybridisation

(D) Electrophoresis

34. Plasmids are suitable vectors for gene cloning because they are

(A) Small circular DNA molecules with their own origin of replication site

(B)Small ciruclar DNA molecules which can integrate with host chromosomal DNA

(C)Having antibiotic genes

(D)Able to shuttle between prokaryotic and eukaryotic cells

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35. Identify the plasmid:

(A)EcoR- I **(B)**pBR 322

(C)Hind III (D)All of the above

36. Automously replicating circular extrachromosomal DNA is called

(A)Chromatin

(B) Plasmid

(C)Palindromic nucleotide sequence

(D)Nucleoid

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

(A) Plasmid that can transfer foreign DNA into a living cell

(B)Cosmids that can cut DNA at specific base sequence

(C)Plasmids that can join defferent DNA fragments

(D)Cosmids that can degrade harmful proteins

38. Vector for T-DNA is

(A)*Salmonell typhimurium*

(B)*Thermus aquaticus*

(C)*Agrobacterium tumefaciens*

(D)*Escherichia coli*

39. 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

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40. Ti plasmid is used for making transgenic plants. It is obtained from

(A)*Azotobacter*

(B)*Agrobacterium*

(C)*Rhizobium* in leguminous root

(D)Yeast

41. Tumor inducing plasmid used in producing transgenci plants is that of

(A)*Escherichia coli*

(B)*Bacillus thuringiensis*

(C)*Agrobacterium tumefaciens*

(D)*Stap[hylococcus aureus]*

42. In gel electrophoresis, differential mobility of DNA depends upon

(A)Helical nature of DNA

(B)Double strandard nature of DNA

(C) Charge and size of DNA

(D)Hydrogen bonding between bases

43. Restriction enzymes are also called

(A)Molecular markers (B)Vectors

(C)Carriers **(D)**Molecular scissors

44. Chemical knives/molecular scissors of DNA are

(A) Restriction en donucleases

(B)Polymerases

(C)Ligases

(D)Transcriptases

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

(A)5′ ……..GATATG……..3′

3′……..CTACTA ……..5′

(B) 5′ ……..GATTC……..3′

3′……..CTACTA……..5′

(C) 5′ ……..CACGTA ……..3′

3′……..CTCAGT……..5′

(D) 5′ ……..CGTTCG ……..3′

3′……..ATGGTA ……..5′

46. The enzyme capable of cutting DNA molecule at specificsites is

(A)Nuclease

(B) Restriction endonuclease

(C)Lipase

(D)Ligase

47. Biollistic technique is used in

(A)Tissue culture process

(B)Hybridisation process

(C)Germplasm conversation process

(D) Gene transfer process

48. The ends of DNA fragments are sticky due to

(A) Unpaired bases (B)Free methylation

(C)Endonuclease (D)Calcium ions

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49. Recombinant DNA bearing ampicillin resistance gene is passed in *E. coli.* The latter are spread on agar plates containing ampicillin. Then

(A)Both transformed and untransformed cells die

(B)Both transformed and untransformed cells grow

(C) Transformed recipient cells die and untransforemed cells grow

(D)Transformed recipient cells die and untransformed cell grow

50. The most extensively used bacteria in genetic engineering is

(A)*Bacillus* (B)*Clostridium*

(C)*Escherichia* (D)*Salmonella*

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