Virtual University of Pakistan

Bt301

Introduction to biotechnology

Full book MCQs

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BT301 MCQ full book

1. Making of yogurt from milk is the example of biotechnology
    a. **Traditional**
    b. Modern
2. Enzyme Celluloses use for the cleaning of
    a. Protein particle
    b. Grass marks
    c. Lipids
3. HUMIRA is an antibody
    a. Diclonal
    b. Monoclonal
    c. Triclonal
4. Craig venter present which cells by beating govt concision on HGP
    a. Stem cells
    b. Ultimate reboot cells
    c. Adult stem cells
5. Risen bread by using yeast is a process
    a. Aerobic respiration
    b. Anaerobic respiration
6. 4000 BC what is use for cheese flavor
    a. Yeast
    b. Mold
7. Risen of bread by yeast this process is called
    a. Extraction
    b. Fermentation
    c. Cleavage
8. 400 BC food is stored by using
    a. Acids
    b. Bases
    c. Salt
9. Leeuwenhoek make how many lenses and microscopes respectively
    a. 100,330
    b. 200,500
    c. 200,400
    d. 500,200
10. Enzyme role in the reaction
    a. Higher the activation energy
    b. Lower the activation energy
    c. No effect on activation energy
11. DNA present in cell which cell organelle

a. Nucleus
b. Mitochondria
c. Chloroplast
d. All

12. MC1R gene controls
    a. U shaped tongue
    b. Curly hairs
    c. Freckles on face
    d. Eye color
13. IPO is abbreviation of ?
    a. INITIAL PUBLIC OFFERING
    b. INTERNAL PUBLIC OFFERING
    c. INITIAL PUBLIC ORGANIZATION
14. Arthropoitem first drug for?
    a. CANCER
    b. Anemia
    c. Arthritics
15. Nerves are covered by sheath called?
    a. Lipids
    b. Myelin
    c. protein
16. Restriction enzymes are brought by
    a. Cohen
    b. Boyer
17. In which disease which enzyme glucocerebrocidase is deficient?
    a. Gaucher
    b. Diabetes
    c. Anemia
18. How many Deoxy-ribonucleotides make the structural units of DNA.
    a. 3
    b. 4
    c. 5
19. nucleotides of DNA are joined together through
    a. Peptide linkage
    b. Ester linkage
    c. Phosphor-diester linkage
20. DNA base composition change with
    a. Change in environment
    b. Change in food
    c. Have no effect
    d. The growing age
21. In DNA, the number of adenosine residues is equal to the number of
    a. Cytosine
    b. Thymine

c. Guanine

22. The DNA helix have primary periodicities
    a. 2.4 angstrom
    b. 3.4 angstrom
    c. 4.4 angstrom
23. Within two strands of DNA phosphodiester bond run in
    a. Opposite direction
    b. Same direction
24. Each ribonucleotide is composed of three components:
    a. A ribose sugar
    b. A Nitrogenous Base
    c. A Phosphoric acid
    d. All of above
25. The process of forming mRNA on a DNA template is known as
    a. Translation
    b. Replication
    c. Transcription
26. The length of mRNA molecules is variable and it depends on
    a. Length of DNA
    b. Length of gene
    c. Length of chromosome
27. tRNA linked with amino acid by
    a. Ionic bond
    b. Covalent bond
28. in ribosomes rRNA contain weight about
    a. 50%
    b. 60%
    c. 70%
29. result of breaks in helix are
    a. Budges
    b. Internal loops
    c. Both
30. Number of stranded amino acids
    a. 19
    b. 20
    c. 21
31. Smallest amino acids is
    a. Alanine
    b. Serine
    c. Glycine
32. Amino acids are attach with each other by a covalent bond called
    a. Ester bond
    b. Hydrogen bond
    c. Peptide bond

33. With the formation of peptide bond between 2 amino acids release a molecule of
    a. Carbon dioxide
    b. Water
    c. Hydrogen
34. In primary structure of amino acids all elements are in co-planer but in
    a. Cis configuration
    b. Trans configuration
35. The helical twist of the α-helix found in all proteins is
    a. Left handed
    b. Right handed
    c. Both
36. The range of $\emptyset, \varphi$ values have a wide range But some values are prohibited because of
    a. Hydrogen bonding
    b. Helical structure
    c. Steric hindrance
37. How many amino acid residues in a single turn of helix
    a. 3.4
    b. 2.6
    c. 3.6
    d. 3.7
38. adjacent polypeptide chains in a sheet can be
    a. Parallel
    b. Anti-parallel
    c. Both
39. A multimer with just a few subunits is called as
    a. Oligomer
    b. Protomer
40. An icosahedron is a regular----cornered polyhedron having ----- triangular faces.
    a. 8, 12
    b. 12, 20
    c. 20, 12
    d. 12, 8
41. Genetic material in viruses can be in form of
    a. DNA
    b. RNA
    c. DNA, RNA both
42. E. coli's chromosome consists of approx. nucleotide pairs.
    a. 5 million
    b. 8 million
    c. 6 million
    d. 4 million
43. In E-coli each super coiled loop have average length of
    a. 10-20 kbp
    b. 1-2 kbp

c. 7-9 kbp

44. The chromosomes of eukaryotic cells are -----than those of prokaryotes
    a. Larger and less complex
    b. Larger and more complex
    c. Small and less complex
    d. Small and more complex
45. DNA with bound histones in the eukaryotes is called as
    a. DNA strand
    b. Chromosome
    c. Chromatin
46. Each nucleosome contain -----bp of DNA and --- histones
    a. 100, 8
    b. 200, 9
    c. 200, 8
    d. 100, 9
47. Highly condensed chromatin is known as
    a. Heterochromatin
    b. Euchromatin
    c. Both
    d. None
48. the study of the entirety of an organism's genes
    a. Genetics
    b. Genomics
    c. None
49. Study of proteome is called
    a. Metabolomics
    b. Proteomics
    c. Genomics
    d. None
50. By gene sequencing we can understand mechanism of which disease
    a. Infectious diseases
    b. Pathogenic bacteria
    c. Viruses
    d. All of above
51. Restriction enzymes are used for
    a. Insertion of vector
    b. Breakdown of proteins
    c. Digestion of DNA
    d. None
52. Which one is example of genomic library
    a. AACs
    b. TACs
    c. BACs
    d. None

53. YACs is abbreviation of
    a. Yeast artificial colonies
    b. Yeast artificial chromosomes
    c. Yeast acidified colonies
    d. None
54. Genomic researches use for
    a. Criminal justices
    b. Civil justices
    c. Establish paternity
    d. All
55. Humans have genome size of ------Mb
    a. 2,500
    b. 2,700
    c. 3,000
    d. 3,500
56. Viral genome is
    a. Circular
    b. Linear
    c. Both
    d. None
57. Lambda contain how many bp in its genome
    a. 47,502 bp
    b. 48,502 bp
    c. 48,500 bp
    d. 47,500 bp
58. Influenza virus have which type of nucleic acid and number of genes
    a. ssDNA ,8
    b. dsDNA ,12
    c. ssRNA ,12
    d. dsRNA ,8
59. Small organisms carry -----coding density.
    a. Low
    b. High
    c. None
60. Over 95% of mitochondrial proteins are encoded in the
    a. Mitochondria
    b. Chloroplast
    c. Endoplasmic reticulum
    d. Nuclear genome
61. How many rRNAs present in case of Human Mitochondrial Genome
    a. 12
    b. 37
    c. 2
    d. 15

62. Chloroplast genome contain which type of inheritance pattern
    a. Mendelian
    b. Non- Mendelian
    c. Both
    d. None
63. Length of Minisatellites
    a. 1-3
    b. 1-5
    c. 1-7
    d. 1-13

64. multicellular eukaryotes have up to genes
    a. 30,000
    b. 40,000
    c. 50,000
    d. 60,000
65. Number of genes is correlated to genome size
    a. True
    b. False
66. Vertebrate genomes can produce more than one polypeptide per gene because of
    a. Alternative splicing of RNA
    b. mRNA
    c. Cellular metabolites
    d. Alternative splicing of DNA
67. Introns are
    a. Coding part of DNA
    b. Non-coding part of DNA
    c. Both
    d. None
68. Percentage of exons in the human genome
    a. 1.3%
    b. 1.4%
    c. **1.5%**
    d. 1.7%
69. Similarity of man- yeast genome is
    a. 21%
    b. 23%
    c. 25%
    d. 27%
70. Distantly related species help us understand events
    a. Ancient evolutionary
    b. Recent
    c. Both
71. Bacteria, Archaea, diverged from each other almost
    a. 1 billion years ago

b. 2 billion years ago
c. 4 billion years ago
d. 6 billion years ago

72. the FOXP2 gene product turns on genes involved in
    a. Baldness
    b. Vocalization
    c. Tumors
    d. All of above
73. prokaryotes genome highly consist of
    a. Gene
    b. Transportable elements
    c. Repeats
    d. None
74. which of the following is start codon
    a. GTA
    b. ATG
    c. AAG
    d. TTG
75. Upstream region with binding site contain TATA box
    a. True
    b. False
76. Polycistronic mRNA encodes for proteins
    a. Few
    b. Several
    c. One
    d. Tow
77. Splicing is Removal of introns from the---- molecule
    a. tRNA
    b. rRNA
    c. mRNA
    d. All of above
78. Most of prokaryotic genes are without introns and in the are
    a. Monocistronic
    b. Dicistronic
    c. Tricistronic
    d. Polycistronic
79. Following are not Nonfunctional copies of genes except
    a. Pseudo gene
    b. Duplicated gene
    c. Tandemly repeated gene
    d. Sequencing gene
80. Ethidium bromide is a
    a. DNA precipitator
    b. Loading dye

c. Digester of DNA
d. None of them

81. Following are example of Non LTR retrotranposons except
    a. LINE
    b. SINE
    c. ORF
    d. None
82. Transposon is cut off by
    a. Transposase
    b. Proteases
    c. Lipases
83. Retrotransposons, which move by means of an
    a. DNA intermediate
    b. RNA intermediate
    c. Both
84. Transposons content in the iris genome is
    a. ~75%
    b. ~85%
    c. ~89%
    d. ~98%
85. How many types of transposons in prokaryotes
    a. One
    b. Two
    c. Three
86. IS10 is found in R plasmids
    a. True
    b. False
87. LTRs stand for
    a. Leading direct Terminal Repeats
    b. Long dominant Terminal Repeats
    c. Long direct Terminal Repeats
    d. Long direct Timid Repeats
88. ORF2 encodes an RNA binding protein
    a. True
    b. False
89. Which of the following is suitable replicon vehicle
    a. Plasmids
    b. Bacteriophage
    c. Both
90. During DNA extraction -----is use for precipitation
    a. Phenol
    b. Isopropanol
    c. Isopropyl
    d. EDTA
91. --------is a fragment of DNA or RNA which is used to detect the sequences of target DNA

   a. **Probe**
   b. Primer
   c. None

1. A technique using X-ray film to visualize fragments of molecules that have been radioactively labeled
   a. Blotting
   b. Autoradiography
   c. Gel electrophorese
   d. Chromatography
2. Autoradiography is use to analyze the
   a. Length of DNA
   b. Number of DNA
   c. Both
   d. None of them
3. A Southern blot is a ----method
   a. Kitchen
   b. Laboratory
   c. Both
   d. None
4. After hybridization reaction, membrane is washed and hybridization are detected by
   a. Blotting
   b. Autoradiography
   c. Gel electrophorese
   d. Chromatography
5. A northern blot is a method used to detect -----molecules among its mixture
   a. Specific DNA
   b. Specific RNA
   c. Specific amino acids
   d. Both
6. In western blotting antibodies are used to detect
   a. DNA fragment
   b. RNA fragment
   c. Specific antigens
   d. None
7. To enable the cells to take up circular vector DNA they have to be made
   a. Polar
   b. Linear
   c. Competent
   d. Both a and c
8. In electroporation is applied to cells in order to increase permeability of the cell membrane to take DNA
   a. Magnetic field
   b. Electric field
   c. Both

9. E. coli is electroporation technique use for introducing
    a. Whole DNA
    b. Fragment of RNA
    c. Cloned genes
    d. None of above
10. Animal cells, protoplasts of yeast and plant are susceptible to transformation by
    a. E.coli
    b. Liposomes
    c. Bacillus subtilis
11. Amplification of genes done by
    a. Gel electrophoresis
    b. PCR
    c. Blotting
12. the phenomenon of restriction and modification elucidated in
    a. 1960s
    b. 1970s
    c. 1980s
    d. 1990s
13. Restriction system allow bacteria to monitor the ---- of incoming DNA
    a. Binding
    b. Origin
    c. Recombining site
    d. None
14. For phage ʎ restriction/ modification is studded on which of the following strain
    a. E. coli C
    b. E. coli K
    c. E. coli D
    d. E. coli C and E. coli K
15. Methylation of certain bases is the process happened in
    a. Restriction
    b. Modification
    c. Recombination
    d. All
16. How many type of R-M system are known
    a. 1
    b. 2
    c. 3
    d. 4
17. In type 1 The active enzyme consists of --restriction subunit,-- modification subunit and --recognition subunit
    a. 2, 3, 2
    b. 1, 2, 3,
    c. 2, 2, 1
    d. 3, 2, 1

18. Most of the useful R-M system is
    a. Type I
    b. Type II
    c. Type III
19. Type ---enzymes recognize a defined sequence and cut within it
    a. Type I
    b. Type II
    c. Type III
20. Restriction occur distant from the recognition site this statement is true for
    a. Type I
    b. Type II
    c. Type III
    d. Type IIs
21. R. HindIII in this name R indicates
    a. Modification-methylase
    b. Specie name
    c. Endonuclease
    d. None
22. AAGCTT is recognition site for
    a. HaeIII
    b. HindIII
    c. HindII
    d. HamHI
23. The number and size of fragments done by restriction enzyme depend on
    a. Origin site of DNA
    b. Recognition site of DNA
    c. Target site of DNA
    d. Binding site of DNA
24. Six base recognition site occurs every
    a. 4^4 bp
    b. 4^6 bp
    c. 4^8 bp
25. ------ the enzyme that degrade DNA
    a. Nucleases
    b. DNA polymerase
    c. Reverse transcriptases
    d. DNA ligases
26. An enzyme that creates a phosphodiester bond
    a. Nucleases
    b. DNA polymerase
    c. Reverse transcriptases
    d. DNA ligases
27. Mainly----- methods are used for joining DNA in vitro
    a. 1

b. 2
c. 3
d. 4

28. ------can repair the nicks produced after the association of cohesive ends of DNA strands
    a. Nucleases
    b. DNA polymerase
    c. Reverse transcriptases
    d. DNA ligases
29. T4 DNA ligase has been used to joint ----DNA molecules
    a. Cohesive ends
    b. Blunt-ended
    c. Single stranded nicks
30. The main difference between linker and adaptor is that former having
    a. Cohesive ends
    b. Blunt-ended
    c. Single stranded nicks
31. Eukaryotic mRNA can be cloned in vector after converting it to
    a. DNA
    b. tRNA
    c. cDNA
32. Naturally occurring bacterial plasmids range in size from
    a. 500 to 40,000 bp
    b. 5,000 to 400,000 bp
    c. 4,000 to 500,000 bp
    d. 3,000 to 400,000 bp
33. Open circle or OC DNA have
    a. Both strand intact
    b. One strand intact
    c. Completely closed
34. -----may be a mutagen, a carcinogen, or a teratogen
    a. Phenol
    b. Isopropanol
    c. Ethidium bromide
    d. Oxygen
35. Which plasmid carry set of tra gene
    a. Conjugated
    b. Non- conjugated
    c. Both
36. Host range of plasmid is determined by
    a. Binding site
    b. Ori region
    c. Tra gene
    d. None
37. Naturally occurring plasmids are stably maintained because they contain

a. Ori region
b. Tra gene
c. Par region
d. None

38. --------of plasmids may arise by deletions or rearrangements of DNA
    a. Incompatibility
    b. Structural instability
    c. segregative stability
    d. Partitioning
39. Single sites for number of restriction endonucleases is property of --- cloning vehicle
    a. Naturally occurring
    b. Ideal
    c. Every
    d. Synthetic
40. Plasmids which were not constructed in vitro for the sole purpose of cloning are called plasmid
    a. **Natural**
    b. Ideal
    c. Every
    d. Synthetic
41. pSC101 Contain
    a. Immunity to colicin
    b. Ampicillin resistance
    c. **Tetracycline resistance**
    d. Colicin E1 production

For final term

For final term

- pSC101 contain ------resistance
  Ampicillin
  Tetracycline
  None
- pBR322 is an example of -----constructed cloning vehicle
  In vivo
  In vitro
  Artificially
- pBR322 contains the resistance gene against
  Ampicillin
  Tetracycline
  Both
  None

- in pBR322 replicon element is
  - pBR11
  - **pMB1**
  - RSf2124
  - PstI
- pBR322 have -----target sites for different restriction enzymes
  - 30
  - 20
  - **40**
  - 50
- pBR322 have high copy number and -----weight
  - High
  - **Low**
- pBR325 encodes ----resistance in addition to those resistance have psc101 plasmid.
  - Ampicillin
  - **Chloramphenicol**
  - Tetracycline
- pAT153 another derivative of
  - pBR325
  - **pBR322**
  - psc101
- plasmids which loss during cell division is called
  - High copy number plasmid
  - Low copy number plasmid
  - **Runaway plasmid**
  - Lambda phage vector
- Wild type is not suitable as a cloning vector because it has ----restriction enzymes sites
  - Very low number of
  - **Too many**
  - A few
- Charon4A is a replacement vector is this statement
  - **True**
  - False
- Charon 60 is a replacement vector is this statement
  - True
  - **False**
- Charon 60 has ----- restriction site
  - **1**
  - 2
  - 3
  - Many
- Charon 4A and 16 are both derivatives of ------
  - Bacteriophage
  - **Lambda**

Ecoli

- Charon 60 can be cloned
  - 2 kbp
  - 3kbp
  - 4kbp
  - **5kbp**
- lacZ gene encode for enzyme
  - PAL
  - 4CA
  - **βGal**
  - PPR
- first step in the cloning is
  - Cutting vector
  - **Isolation of DNA**
  - Insertion of vector
  - Infection
- in case phage-λ Packaging yields about ----- of vector DNA
  - 10^4 plaques/ µg
  - 10^5 plaques/ µg
  - **10^6 plaques/ µg**
- At each cos site nicks are introduce ----- far apart on opposite strand of DNA
  - 10bp
  - 13bp
  - **12bp**
  - 16bp
- Cos sits are
  - Cloning site
  - Cooperative site
  - **Cohesive site**
  - Capsulation site
- Gene D is include in the --- process
  - **Capsulation**
  - Ligation
  - Termination
  - Packaging
- M13 is a filamentous bacteriophage with-----
  - dsDNA
  - **ssDNA**
  - dsRNA
  - ssRNA
- Which of the following vector replicate without killing its host
  - Phage-λ
  - **M13**
  - Mp18

Cosmid

- M13 can clone DNA of variable length about
  - 3kpb
  - 4kbp
  - **5kbp**
  - 6kbp
- In x gal containing medium blue colonies represent the cloned DNA colonies, statement is
  - True
  - **False**
- Cosmid can clone around ------length of DNA
  - **45kbp**
  - 37kbp
  - 53kbp
  - 200kbp
- Modified cosmid vector produced by ----- in 1981
  - Watson and crick
  - Ish-Horowicz and Burke
  - Edward Southern
  - **Bates and Swift**
- A modified procedure for cosmid is derived by
  - Watson and crick
  - **Ish-Horowicz and Burke**
  - Edward Southern
  - Bates and Swift
- Cosmid c2XB is derived by
  - Watson and crick
  - Ish-Horowicz and Burke
  - Edward Southern
  - **Bates and Swift**
- -----vectors are combination of plasmid and ʎ phage sequences
  - Lambda
  - **Phasmid**
  - Cosmid
- BACs can clone ----------length of DNA fragment
  - 5kbp
  - 150-200kbp
  - **100-300 kbp**
  - 60kbp
- YACs vectors replicate in ------like normal chromosome
  - Bacteria
  - **Yeast**
  - Fungi
  - Mammalian cell
- YACs can clone ----------length of DNA fragment

5kbp
150-200kbp
100-300 kbp
60kbp

- Vectors that can replicate and are stably maintained in two or more unrelated host organisms are called
  YACs
  Shuttle vectors
  BACs
  Cosmid vector
- Expression vector are used to control
  Infection
  Expression
  Translation
  Insertion
- In Ecoli p1 phage can clone -----length of DNA
  10-15 kb
  2-25 kb
  35-45 kb
  70-100 kb
- The second strategy is to selectively amplify the target sequence directly from the source DNA by using
  Different vectors
  PCR
  Gel electrophoresis
- ---- represent the genomic makeup of an organism
  cDNA library
  RNA sequence
  Genomic library
- Genome size of human is
  $2.8x10^6$
  $3x10^6$
  $1.25x10^5$
- Drosophila melanogaster have size of DNA $1.8x10^5$ this statement is
  True
  False
- Average fragment size can be controlled by----------
  Restriction endonucleases
  Mechanical shearing
  Random cutting
- High molecular weight genomic DNA is digested with-------
  BamH1
  ***Sau*3AI**
  Sal1

PmB1

- For construction of genomic libraries ----vectors are required
  High capacity cloning
  Low capacity cloning
  Moderate capacity cloning
- ------is prepared by reverse-transcribing cellular RNA
  DNA
  cDNA
  Proteins
  Amino acids
- Which lack the non-coding sequence
  DNA
  rRNA
  cDNA
- Introns are rare in bacteria but occur in genes of higher
  Eukaryotes
  Prokaryotes
- cDNA library is representative of the ---population from which it was derived
  DNA
  RNA
  Proteins
- A serious disadvantage of the hairpin method is that cleavage with S1 nuclease results in the loss of sequences at the
  3' end of the clone
  5' end of the clone
- correct orientation of inserted cDNA can be achieved by------
  Hairpin method
  Self-priming method
  Sequencing
  Reverse transcriptase method
- -----followed by the PCR (RTPCR) leads to the amplification of RNA sequences in cDNA form
  Genomic library
  Reverse transcription
  Splicing
  Digestion of DNA
- Major screening strategies involve Genetic methods
  Sequence-dependent screening
  Screening expression libraries
  All of above
- All useful vector molecules carry a selectable ---------or property
  Nutritional marker
  Genetic marker
  Drug resistance
- In phage vectors, ------is itself the selected property

AP^R
TC^R
Plaque formation
CH^R

- Nucleic acid ----------is the most commonly used method of library screening
  - Amplification
  - Sequencing
  - **Hybridization**
  - Screening
- --------- (1975) developed a screening procedure to detect DNA sequences in transformed colonies
  - Ish-Horowicz and Burke
  - Edward Southern
  - Bates and Swift
  - **Grunstein and Hogness**
- The results of the hybridization can be monitored by
  - PCR
  - **Autoradiography**
  - Gel documentation
  - Centrifuge
- Benton and Davis (1977) devised a method called
  - Hybridization
  - **Plaque lift**
  - Sequencing
  - Screening
- In plaque lift techniques there is direct contact between plaque and filter this statement is
  - False
  - **True**
- A great advantage of hybridization for library screening is that it is extremely
  - Important
  - **Versatile**
  - Difficult
  - Unique
- A cloned genomic fragment must be found as a ------point for the walk
  - Mid
  - End
  - **Starting**
  - Selectable
- In chromosome walking, human genome starting point may be a ----
  - CAPs
  - SNPs
  - **RFLP**
  - AFLP

- One----- of chromosome walking is the requirement that each DNA segment used is not repeated elsewhere in the genome
    - Benefit
    - **Drawback**
    - Characteristics
- In chromosome jumping, the DNA of interest is identified, cut into fragments with restriction enzymes and
    - Elongate
    - **Circularized**
    - Break down
    - Straighten
- Cloned DNAs from the closure sites make up a jumping library is this statement
    - False
    - **True**
- The PCR is widely used to isolate specific DNA sequences from-----genomic DNA or cDNA
    - Cloned
    - **Uncloned**
    - Gel treated
- To isolate specific clone, PCR is carried out with
    - Simple primers
    - Unusual primers
    - Special primers
    - **Gene-specific primers**
- A degenerate primer is a mixture of primers, all of similar sequences but with variations at --- positions
    - One
    - Two
    - **One or more**
    - Several
- If DNA library is established using expression vectors, each individual clone can be expressed to yield a
    - Monopeptide
    - **Polypeptide**
    - Dipeptide
- Immunochemical screening involves the use of
    - **Antibodies**
    - Antigen
    - Nucleic acid
    - RNA
- The molecular target for recognition is generally an
    - Antibody
    - **Epitope**
    - Probe
    - Primer

- polyvinyl and that IgG antibodies can be readily labelled with
  - **I^{125}**
  - I^{108}
  - I^{127}
  - I^{129}
- it is much more convenient to use--- because they have high capacity and efficiency to in vitro packaging
  - Bacteriophage simple insertion vector
  - Bacteriophage Ecoli 1 insertion vector
  - **Bacteriophage-ʎ insertion vector**
  - Bacteriophage-ʎ deletion vectors
- Screening is carried out without using an antibody, by incubating the membranes with radiolabelled ----------
  - Ss DNA probe
  - **ds DNA probe**
  - Ss RNA probe
- -----is the process by which a particular DNA sequence compensates for a missing function in a mutant cell and thus restores the wild type phenotype
  - **Functional complementation**
  - Functional analysis
  - Functional genomics
  - Non Functional complementation
- Functional complementation is also possible in
  - **Transgenic animals and plants**
  - Transgenic animals
  - Transgenic plants
  - Transgenic bacteria
- Functional complementation used for complementation in -----to isolate the Shaker - 2 gene
  - Transgenic cat
  - **Transgenic mice**
  - Transgenic bacteria
- -----depends upon transcription of appropriate gene, efficient translation of mRNA and in many cases, posttranslational processing and compartmentalization of nascent polypeptide
  - Synthesis of functional DNA
  - Synthesis of functional RNA
  - **Synthesis of functional protein**
- Gram-negative bacteria such as E. coli have a
  - Complex wall-membrane mitochondria
  - Simple wall-membrane
  - **Complex wall-membrane**
  - Difficult wall-membrane
- The bacterial inner membrane, periplasmic space and outer membrane all contain proteins found in the cytoplasm
  - True

False

- ABC pathway of protein export and type II secretion pathway are use for
  - Chromosome trafficking
  - DNA trafficking
  - RNA trafficking
  - **Protein trafficking**
- In E.coli foreign protein are
  - Stable
  - **Instable**
  - Dissolved
  - Submerged
- In the case of somatostatin, degradation was prevented by producing a ------consisting of somatostatin and β-galactosidase
  - Simple protein
  - **Fused protein**
  - Complex protein
  - Hybrid DNA
- Expression from a strong promoter can represent ----of cloned gene product of toral cell protein
  - 30-40%
  - 10-40%
  - **20-40%**
  - 20-30%
- Complementarity of Shine-Dalgarno (S-D) sequence with 16s rRNA can affect the
  - Rate of transcription
  - **Rate of translation**
  - Rate of enzyme
  - Rate of cell cycle
- Composition of triplet immediately preceding the AUG ----also affects the efficiency of translation
  - **Start codon**
  - Stop codon
  - Termination site
- The rate of synthesis of a particular protein will depend on the ---------in the cell
  - Steady-state of RNA
  - Steady-state of DNA
  - **Steady-state of mRNA**
  - Mobile-state of mRNA
- ---------usually proceeds by a combination of endonuclease and 3'exonuclease attack
  - Synthesis of mRNA
  - **Degradation of mRNA**
  - Degradation of DNA
  - Degradation of protein
- One way of increasing the expression of a cloned gene is to increase the
  - Temperature

Plasmid copy number
Enzyme
pH

- The loss of plasmids due to defective partitioning is called
  Segregative stability
  Segregative instability
  Non-Segregative stability
  Non-Segregative instability
- Structural instability of plasmids may arise by deletions or rearrangements of
  RNA
  mRNA
  DNA
  rRNA
- Techniques for DNA sequencing became available in the
  Early 1970s
  Late 1970s
  Early 198s
  Late 1980s
- Maxam-Gilbert method for DNA sequencing makes use of chemical reagents to bring about ------ of the DNA
  Base-specific addition
  Base-specific cleavage
  Digestion
  Rearrangement
- DNA synthesis is carried out in the presence of the four deoxynucleoside triphospahtes, one or more of which is labelled with ----- and in four separate incubation mixes
  N^{15}
  P^{32}
  N^{14}
  P^{35}
- The combination of chain terminator and M13 vectors to produce -----is very powerful
  dsDNA
  ssDNA
  dsRNA
  ssRNA
- Sequences that were read beyond 4oo bp contained an average of ---error
  2.3%
  3.2%
  3.4%
  4.4%
- Sequences that were read less than 4oo bp contained an average of ---error
  2.3%
  2.8%
  3.2%

4.4%

- --------is a process to change the genetic information of an organism
  Hybridization
  Autoradiography
  Mutagenesis
  Genetic library
- Mutagenesis sources
  Occur naturally
  Exposure to mutagens
  Induced in laboratory
  All of above
- ----different methods of site-directed mutagenesis
  2
  3
  4
  5
- A synthetic DNA fragment containing the desired mutant sequence is used to replace the corresponding sequence in the wild-type gene
  Cassette mutagenesis
  Primer extension
  Procedures based on PCR
- In -----method, the product of the first PCR is used for the second PCR
  Site directed PCR
  Megaprimer
  Basic PCR
- The ----of a PCR based mutagenic protocol is that the desired mutation is obtained with 100% efficiency
  Advantage
  Disadvantage

  None
- PCR can also be used to generate DNA fragments for gene cloning by using ---with specific restriction sites
  Probes
  Primers
  Both
  None
- Nucleotides are building block of
  Proteins
  Lipids
  DNA
  All of above
  - Taq polymerase is a ----DNA
    Thermostable

Thermoinstable
Binding resistant

- ----------is a short strand of oligonucleotide that serves as a starting point for DNA synthesis
  Probes
  Primers
  Both
- --------was designed to amplify RNA sequences (mainly mRNA) through synthesis of cDNA by reverse transcriptase
  RT-PCR
  q PCR
  Nested PCR
  Inverse PCR
- It is used to measure starting amounts of DNA, cDNA, or RNA
  RT-PCR
  q PCR
  Nested PCR
  Inverse PCR
- In --------two sets of primers are used in two successive PCRs
  RT-PCR
  q PCR
  Nested PCR
  Inverse PCR
- ----------is used to identify the flanking sequences around genomic inserts
  RT-PCR
  q PCR
  Nested PCR
  Inverse PCR
- Multiplex PCR is used to amplify several different DNA sequences simultaneously
  True
  False
- ---------is a type of PCR reaction but the segments of DNA that are amplified are random
  AFLP
  RAPD
  SNPs
  RFLP
- AFLPs-Amplified fragment length polymorphisms are differences in restriction fragments length caused by
  AFLP
  RAPD
  SNPs
  RFLP
- PCR has applications in the fields of life sciences
  Genetic engineering
  Medical

Forensic
All of above
Both a b

- PCR has been used in gene cloning and ------of genomic libraries
  Sequencing
  Screening
  Construction
  Degradation
- DNA profiling or DNA fingerprinting have --------meaning
  Different
  Same
- DNA profiling or DNA fingerprinting is a forensic technique used to identify individuals by characteristics of their..
  Protein
  RNA
  DNA
  cDNA Genomic library
- Assigning of a specific gene to particular region of a chromosome and determining the location of and relative distances between genes on the chromosome is called
  Chromosome jumping
  Chromosome walking
  Chromosome mapping
- Any identifiable feature of the genome cannot serve as a marker in mapping, but specific
  True
  False
- The landmarks on genome map might include
  Short DNA sequences
  Regulatory sites
  Genes themselves
  All of above
- Genetic linkage maps illustrate the order of genes or genetic markers on a chromosome and the relative distances between those genes
  DNA finger printing
  Physical mapping
  Genetic linkage mapping
- ----------give the DNA base pair distances from one landmark to another
  DNA finger printing
  Physical mapping
  Genetic linkage mapping
- ----------exploits variations in homologous DNA sequences
  AFLP
  RAPD
  SNPs
  RFLP

- Botstein et al. (1980) were the first to recognize that ----that target RFLPs can be used for mapping
  - **DNA probes**
  - DNA primers
  - RNA primers
- Sequence-tagged sites (STS) are more convenient markers than RFLPs because they do not use
  - RT-PCR
  - **Southern blotting**
  - Restriction enzyme
  - DNA polymerase
- SNPs are -----base-pair positions in genomic DNA at which different sequence alternatives (alleles) exist in a population
  - **Single**
  - Double
  - Triple
  - Complementry
- Amplified fragment length polymorphisms (AFLP) is a diagnostic fingerprinting technique that detects genomic
  - Amplified fragment
  - **Restriction fragments**
  - Complemenrtry fragment
- FISH is a cytogenetic method that used ----probes
  - Scanning
  - **Fluorescent**
  - Radio active
- RH mapping used X-ray breakage of chromosomes to determine the distances between ---as well as their order on the chromosome
  - DNA probes
  - DNA primers
  - **DNA markers**
- Happy mapping is an ------technique
  - In vivo
  - **In vitro**
  - None
- The process of determining the exact order of nucleotides within a DNA or RNA molecule is called
  - Screening
  - **Sequencing**
  - Mapping
- Shotgun sequencing is used for sequencing -------DNA strands
  - Short
  - **Long**
  - Fragmented
  - Digested

- --------- a map of each chromosome of the genome is made before the DNA is split up into fragments for sequencing
  - Chromosome sequencing
  - **In clone-by-clone sequencing**
  - Physical mapping
  - Genetic linkage mapping
- Orthologs are homologous genes in different organisms that encode proteins with the
  - Different functions
  - **Same function**
  - Non functional
- Genome of bacteria may be of variable in size. For example, it may vary from
  - 0.39Mb to 8.1 Mb
  - **0.49 Mb to 9.1 Mb**
  - 0.49Mb to 1.9Mb
- Mitochondrial genomes exhibit an amazing
  - Genomic diversity
  - **Structural diversity**
  - Functional diversity
  - Phenotypic diversity
- ----are used to study the expression of many genes at once
  - Comparative genomics
  - **Microarrays**
  - Filamentous bodies
- Which is the DNA array used in expression analysis
  - Spotted DNA arrays
  - Printed oligonucleotide chips
  - **Both**
  - None
- The predominate application of DNA microarray has been to measure
  - **Gene expression levels**
  - Gene synthesis level
  - Genetic difference
- Microarrays have been widely used as ----------genotyping platforms
  - AFLP
  - RAPD
  - **SNP**
  - RFLP
- Phage display is the technology that allows expression of exogenous -----on the surface of phage particles
  - Monopeptide
  - Dipeptide
  - **Polypeptides**
  - Nucleotide

- The most common screening method is based on enriching the phage clones with binding affinity for the target by a process called
  - Epitope
  - **Biopanning**
  - Microarrays
- Applications of phage display includes
  - Determination of protein to protein interactions,
  - To determine enzyme specificity
  - To generate target specific antibodies
  - Both a b
  - **All of above**
- A genetic technique in which one of an organism's gene is made inoperative that is simply called
  - Knocked in
  - **Knocked out**
  - Knocked down
- ---- refers to a gene manipulation method that involves the insertion of a protein coding cDNA sequence at a particular locus in an organism's chromosome
  - **Knocked in**
  - Knocked out
  - Knocked down
- Small interfering RNA (siRNA) is the most commonly used (RNAi) tool for inducing ----------coding genes
  - Long-term silencing of protein
  - **Short-term silencing of protein**
  - Permanent silencing of protein