ETERNAL CAREER CLASSES

1. The multiplication of any alien piece of DNA in an organism needs be a part of a chromosome as these chromosomes :
(a) Provide protein factor for replication
(b) Gives energy units for their survival
(c) Provide origin of replication (ori-sire)
(d) Provide protein for the protection of alien piece of DNA

2. Plasmid used to make the first recombinant DNA was isolated from which bacterium ?
(a) E.coli
(b) Salmonella typhimurium
(c) Agrobacterium
(d) Streptococcus

3. An important factor which makes the plasmid act as vector in genetic engineering is :
(a) It can carry foreign gene
(b) It is resistant to heavy metals
(c) It is resistant to antibiotics
(d) It is sensitive to antibiotics

4. Genetic engineering is possible, because :
(a) We can cut DNA at specific sites by endonucleases like DNase
(b) Restriction endonucleases purified from bacteria can be used in vitro
(c) The phenomenon of transduction in bacteria is well understood
(d) We can see DNA by electron microscope

5. The process of replication in plasmid DNA, other than initiation, is controlled by :
(a) Mitochondrial gene (b) Plasmid gene
(c) Bacterial gene (d) None of these

6. The first restriction endonuclease to be discovered was :
(a) Hind II (b) Eco R I
(c) Bam H I (d) Pst I

7. Approximately how many restriction enzymes have been isolated from the different (over 230) strains of bacteria ?
(a) 300 (b) 600
(c) 750 (d) 900

8. The linking of antibiotic resistance gene with the plasmid vector became possible with :
(a) Exonucleases (b) DNA ligase
(c) Endonucleases (d) DNA polymerase

9. Molecular scissors refer to :
(a) Restriction enzymes
(b) Ribozymes
(c) Recombinant DNA
(d) Vectors

10. The bacteria used for genetic engineering in plants is :
(a) Agrobacterium (b) Bacillus
(c) Pseudomonas (d) Clostridium

11. Insertional inactivation is related to :
(a) Microinjection
(b) Gene gun
(c) Gel electrophoresis
(d) Selection of recombinants

12. 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

13. After electrophoresis, the separated DNA fragment can be visualised in ethidium bromide gel exposed to UV light. These DNA fragments appear as what coloured bands ?
(a) Orange (b) Blue
(c) Silver (d) Green

14. After completing the transformation experiment involving the coding sequence of enzyme β-galactosidase, the recombinant colonies should :
(a) Give blue colour
(b) Not give blue colour
(c) Have active α-galactosidase
(d) Both (a) and (c)

15. Which of the following has the ability to transform normal cells in to cancerous cells in animals ?
(a) Agrobacterium tumifaciens
(b) Retroviruses
(c) DNA-viruses
(d) Plasmids

16. Which of the following method can be used for making the bacterial cell 'competent' ?

(a) Treating with specific concentration of divalent cation ($Ca^{2+}$)
(b) Treating with specific concentration of monovalent cation ($K^{+}$)
(c) Heat shock
(d) Both (a) and (c)

***17.*** Which of the following techniques can be used to introduce foreign DNA into cell ?
(a) Using disarmed pathogen
(b) Micorinjection
(c) Gene gun
(d) All of the above

***18.*** Two microbes found to be very useful in genetic engineering are :
(a) Crown gall bacterium and Caenorhabditis elegans
(b) Escherichia coli and Agrobacterium tumefaciens
(c) Vibrio cholerae and a tailed bacteriophage
(d) Diplococcus and Pseudomonas

***19.*** The restriction endonuclease breaks bonds between :
(a) DNA-RNA hybrid
(b) Introns
(c) Nucleotides, *i.e.*, breaks the phosphodiester bond
(d) Pentose sugar and nitrogenous base, *i.e*, breaks N-glycosidic bond

***20.*** If many copies of the target DNA is to be expected, which vector is preferable ?
(a) Vector have numerous restriction side
(b) Vector whose origin supports high copy number
(c) Vector lacking ori-site
(d) All are incorrect

***21.*** Restriction endonuclease :
(a) Synthesizes DNA
(b) Cuts the DNA molecule randomly
(c) Cuts the DNA molecule at specific site
(d) Restricts the synthesis of DNA inside the nucleus

***22.*** What is true for plasmid ?
(a) Plasmids are widely used in gene transfer
(b) These are found in viruses
(c) Plasmid contains gene for vital activities
(d) These are main part of chromosome

***23.*** Which of the following cut the DNA from specific places ?
(a) E.coli Restriction endonuclease
(b) Ligase
(c) Exonuclease
(d) Alkaline phosphatase

***24.*** In bacteria, plasmid is :
(a) Extra chromosomal material
(b) Main DNA
(c) Non-functional DNA
(d) Repetitive gene

***25.*** Restriction endonucleases :
(a) Are present in mammalian cells for degradation of DNA when the cell dies
(b) Are used in genetic engineering for ligating two DNA molecules
(c) Are used for in vitro DNA synthesis
(d) Are synthesized by bacteria as part of defense mechanism

***26.*** Which of the following is a reporter gene ?
(a) lac Z (β-galactosidase)
(b) gfp (green fluorescent)
(c) cat (chloramphenicol acetyl transferase)
(d) All of the above

***27.*** Polyethylene glycol method is used for :
(a) Energy production from sewage
(b) Gene transfer without a vector
(c) Biodiesel production
(d) Seedless fruit production

***28.*** Plasmids are used in genetic engineering because they are :
(a) Easily available
(b) Able to integrate with host chromosome
(c) Able to replicate along with chromosomal DNA
(d) Contain DNA sequences coding for drug resistance

***29.*** T-DNA is found in ?
(a) Ti-plasmid (b) Phagemid
(c) pBR 322 (d) pUC 18

***30.*** Restriction enzymes cut the strands of DNA a little away from the centre of the palindromic site, but between the same two bases on the opposite single stranded strands, these overhanging stretches formed on each strands, are called as :
(a) Blunts ends
(b) Sticky ends
(c) Staggered end
(d) Both (a) and (c)

***31.*** The cutting of DNA by restriction endonucleases results in the 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

***32.*** The DNA fragments separated can be visualised only after staining DNA with a compound followed by exposure to radiations :
(a) Methylene blue, visible
(b) Ethidium bromide, UV
(c) Giemsa, visible

(d) Quinacrine, visible

**33.** 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

**34.** The technique in which a foreign DNA is precipitated on the surface of the tungsten or gold particles and short into the target cells is known as :
(a) Microinjection
(b) Chemical-mediated genetic transformation
(c) Electroporation
(d) Biolistic

**35.** All the following are the properties of the enzyme *Taq* polymerase except :
(a) It is thermostable DNA polymerase
(b) It is isolated for a bacterium, Thermus aquaticus
(c) It is used for amplification of gene of interest using PCR
(d) It is thermostable RNA polymerase

**36.** The uptakes of genes by cells in microbes is termed as :
(a) Lipofection (b) Transformation
(c) Transfection (d) Transduction

**37.** Which of the following is the first constructued cloning vector ?
(a) YAC (b) BAC
(c) pBR322 (d) Cosmid vectors

**38.** Restriction endonucleases are the most widely used in recombinant DNA technology. They are obtained from :
(a) Bacteriophage
(b) Bacterial cells
(c) Plasmids
(d) All prokaryotic cells

**39.** Which of the following produces blunt ends ?
(a) Hind III and Sma I (b) Hae II and Sma I
(c) EcoR I and EcoR II (d) Hind II and Sma I

**40.** In the year 1963, the two enzymes responsible for restricting the growth of bacteriophage in Escherichia coli were isolated. They were ____ and _____ and respectively
(a) Ligase, Restriction endonuclease
(b) Helicase, Restriction endonuclease
(c) Methylase, Restriction endonuclease
(d) DNA polymerase, Restriction endonuclease

**41.** Exonucleases :
(a) Are restriction enzymes which cut DAN internally
(b) Can destroy both DNA and RNA
(c) Are absent in bacteria
(d) Rarely identify nucleotides

**42.** Recombinant DNA is achieved by cleaving the pro-DNAs by :
(a) Ligase
(b) Restriction endonuclease
(c) Primase
(d) Exonuclease

**43.** 'Passenger DNA' is :
(a) Plasmid vector
(b) Antibiotic resistance gene
(c) Reporter gene
(d) Desired gene fragment *i.e.*, gene of interest

**44.** Why are yeasts cells frequently used as hosts for cloning eukaryotic gene ?
(a) They are eukaryotic cells
(b) Only yeast cell allow eukaryotic gene to be cloned
(c) They lack plasmids
(d) They can remove exons from mRNA

**45.** A selectable marker is :
(a) β-gal gene
(b) Ampicillin resistant gene
(c) Tetracyclin resistant gene
(d) More than one as mentioned above

**46.** Which of the restriction endonuclease is widely used in genetic engineering ?
(a) Type-II (b) Type-I
(c) Type-III (d) Type-IV

**47.** Choose the odd one out w.r.t. transformation experiment :
(a) Chilled $CaCl_2$
(b) Recombinant DNA
(c) E.coli
(d) temperature of 94°C

**48.** What is the disadvantage of using pBR 322 as cloning vector ?
(a) Reasonably high copy number is produced
(b) Size is 4.3 kb
(c) Both (a) and (b)
(d) Selection of recombinants due to inactivation of antibiotics require simultaneous planting on two plates having different antibiotics

**49.** Bacteriophages being used as cloning vectors is/are :
(a) $\lambda$ -phage (b) M-13 phage
(c) Both (a) and (b) (d) $T_4$-phage

**50.** Disarmed Ti-plasmid :
(a) Lacks T-DNA
(b) Lacks ori-site
(c) Possess T-DNA
(d) Lacks virulenece region