2 marks: 1

1. r-DNA technology:

Recombinant DNA molecules are a DNA molecule by laboratory methods and the production of a unique DNA molecule. DNA fragment derived from different biological sources, and joining together 2 or more DNA fragments.

2. Gene cloning:

⇒ Gene cloning is the set of experimental methods in molecular biology.

⇒ It is used to assemble recombinant DNA, to direct their replication within host organisms.

3. Importance of r-DNA technology:

⇒ r-DNA technology is used for the biomedical sciences.

⇒ It is helpful to give clear idea regarding the molecular basis of a number of diseases. Eg: thalassemia, cystic fibrosis.

⇒ Using this technology, a large quantity of human proteins can be produced for theraphy. Protein for vaccines eg: Hepatitis B.

4. Gene manipulation :

⇒ Genetic engineering also called Genetic modification (or) Genetic manipulation.

⇒ It is direct manipulation of an organism's genes using biotechnology.

⇒ Genetic engineering has been applied in research, medicine, and agriculture field.

5. Genomic Library :

⇒ Genomic library is a collection of clones and all of DNA Segments (genome of an organisms).

⇒ Genomic library is otherwise called as Genomic DNA library and gene bank (or) gene library.

6. Restriction endonuclease :

⇒ Restriction endonuclease is cut the DNA unique Sequence.

⇒ It is also used as rejoinable DNA fragments.

7. RE. Mode of action :

⇒ A Restriction enzyme or restriction endonuclease is an enzyme that cuts double stranded DNA.

⇒ The enzyme makes two incisions, one through each of the sugar-phosphate backbones that is each strand of the double helix without damaging the nitrogenous bases.

8. Ligases :

⇒ It is an enzyme which brings about ligation of DNA or another substances.

⇒ In biochemistry, a ligase is an enzyme that can catalyze the joining of 2 large molecule by forming a new chemical bond.

9. DNA polymerase :

⇒ DNA polymerase is an enzyme that synthesizes DNA molecules from deoxyribonucleotides, the building blocks of DNA.

⇒ These enzymes are essential for DNA replication and usually work in pairs to create 2 identical DNA strands from a single original DNA molecule.

10. DNA modifying enzymes :

* Histone modifying enzymes
* TBE buffer
* DNA methyltransferase
* Deoxyribonuclease.

11. Cloning vectors :

⇒ Cloning vector is a small piece of DNA that can be stably maintained in an organism and into which a foreign DNA fragment can be inserted for cloning purposes.

⇒ Eg : DNA from virus, plasmid of bacterium.

12. Properties of cloning vectors :

⇒ The vectors needs to have a selectable marker.

⇒ The vector should have ori site from where replication can begin.

⇒ The vector needs to be DNA molecule so that it can be cloned with the gene of interest.

13. Natural vectors :

A vector containing foreign DNA is termed recombinant DNA. The four major types of vectors are plasmids, viral vectors, cosmids & artificial chromosomes.

14. PBR322 :

⇒ PBR322 is a plasmid & was one of the first widely used in E. coli cloning vectors.

⇒ It was discovered by Herbert Boyer in 1977.

15. cosmid : 5

⇒ A cosmid is a type of hybrid plasmid that contains a lambda phage cos sequence.

(Cos sites + plasmid = cosmids)

⇒ It is used in genetic engineering.

16. DNA Transfer :

⇒ The transfer DNA is the transferred DNA of the tumor-inducing plasmids of some species of bacteria such as Agrobacterium tumifaciens and Agrobacterium rhizogenes.

⇒ The T-DNA is transferred from bacterium into the host plant's nuclear DNA genome.

17. Screening of recombinants :

A genetic screen or mutagenesis screen is an experimental technique used to identify and select for individuals who possesses a phenotype of interest in a mutagenised population.

18. gene gun :

In genetic engineering, a gene gun or biolistic particle delivery system is a device used to deliver exogenous DNA, RNA or protein to cells.

19. DEAE methods:

⇒ Diethylaminoethyl Cellulose is a nucleic acid - DEAE dextran complexes are formed via electrostatic interactions between the polymer and phosphate backbone of nucleic acid.

⇒ wash cells to remove the complexes & incubate to allow gene expression.

20. Biolistic method:

Gene transfer through a gene gun is the part of Biolistic method. During this method DNA or RNA construct adheres to biological inert particles such as (gold or tungsten) to form DNA particle complex.

21. Southern Blotting:

Southern blotting is a laboratory technique used to detect a specific DNA sequence in a blood or tissue sample. The DNA fragments are transferred out of the gel to the surface of a membrane.

22. PCR:

⇒ It is polymerase chain reaction.

⇒ In this method widely used in molecular biology to

rapidly make millions to billions copies of specific DNA Sample.

23. DNA Amplification:

⇒ The production of multiple copies of a sequences of DNA. Repeated copying of a piece DNA.

⇒ It is play a role in cancer cells.

24. DNA fingerprinting:

⇒ DNA fingerprinting is a laboratory technique used to establish a link between biological evidence and a Suspect in criminal investigation.

25. DNA microarray:

DNA microarray is a collection of microscopic DNA spots attached to a solid surface. Each DNA spots contains picomoles of a specific DNA sequences known as probes.