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QNO 1

ANS :- VACCINE :- The word vaccine originates from the latin words vaccinea which Edward Jenner demonstrated in could prevent small pox in 1798 humans

- Today the term vaccine applies to all preparation produce from dead organism that enhance immunity against disease and either prevent (prophylactic vaccine )or ,in some cases treat disease (therapeutic vaccine ).

Types of vaccine :-

LIVE VACCINE :- These vaccine are composed of live ,attenuated microorganism that cause a limited infection in there host sufficient to induce on immune response ,but insufficient to cause disease .

KILLED VACCINE :- when it is unsafe to use live microorganism to prepare vaccine they are killed are inactivated .these are preparation of the normal infectious pathogenic microorganism that have been rendered non pathogenic ,usually by treatment with using heat so that they can not replicate to all .

SUB UNIT VACCINE :- a sub unit vaccine as a fragment of a pathogen ,typically a surface protein that is used to trigger on immune response and stimulate acquired immunity against the pathogen form which it is derived .

RECOMBINANT VACCINE :- Recombinant vaccine are those in which genes for desired antigen for a microbe are inserted to a vector .

DNA VACCINE :- The DNA is injected into the muscle of the animals being vaccinated ,usually with a gene gun that uses compressed gas to blow the DNA to the muscle cell .

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QNO 2

ANS 2 :- RESTRICTION MODIFICATION SYSTEM :- restriction modification system are important component to prokaryotic defense mechanism against invading genomes

- They occur in a wide variety of unicellular organism including bacteria and archaea .
- They comprise two contrasting enzymatic activities
  - restriction endonuclease
  - methyltransferase

- Phage or virus invade all type of cell
- Bacteria are one favorite target
- Defense mechanism have been developed by bacteria to defend themselves from these invasion .
- Each bacterial species and strain has there own combination of restriction and methylating enzymes

RESTRICTION ENZYMES :- on enzymes that cut DNA at internal phosphodiester bond ,different type exist and the most useful one for molecular biology (type 2 ) are those which cleave at a specific DNA sequence .

METHYLASE :- on enzymes that add a methyle group to a molecule ,in restriction modification system of bacteria a methyle group is add to DNA at a specific site to protect the site from restriction endonuclease cleavage .

QNO 3

ANS 3 :- RECOMBINANT DNA (r DNA ):-

- DNA molecules formed by laboratory methods of genetic recombination (such as molecular cloning )to bring together genetic material from multiple sources .
- This is DNA that has been formed artificially by combining constituents from different organism .

RECOMBINANT DNA TECHNOLOGY :-

- Using recombinant DNA technology ,we can isolate and clone single copy of a DNA segment into an indefinite number of copies,all identical .
- Simply defined ,it is the art of cutting and pasting genes.

MAJOR APPLICATIONS OF r DNA TECH :-

- DNA sequencing
- Mutation studies
- Transformation genetic engineering
- Recombination DNA libraries
- Restriction enzymes site analysis
- Polymerase chain reaction .

QNO 1

ANS :-

- 1)Denaturation ,annealing and extension
- 2)vaccinae
- 3) yeast

- 4)molecular scissors
  - 5)restriction map
  - 6)DNA finger printing
  - 7)restriction endonuclease ,methylase enzyme.
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QNO: 2 PART NO: 2

ANS BIOTECHNOLOGY :- it is the use of biological system such as microorganism ,whole cell or there molecule ,to solve problem or to make useful product .

- The wide concept of biotechnology encompasses a wide range of procedure for modifying living organism according to human purpose ,going back to domestication of animals ,cultivation of the plants ,and “improvement “to these through breeding program that employ artificial selection and hybridization .modern usages also include genetic engineering as well as cell and tissue culture technology .

SCOPE OF BIOTECHNOLOGY :- improvement of clinical testing and diagnostic tools .

- Production of novel varieties of crops and plants and animals
  - The production of pharmaceutical product for the cure of many human disease
  - The production of mono clonal antibody ,DNA AND RNA probe for diagnosis of various disease .
  - Manipulation of living organism system to develop product .
  - Field integrates knowledge from biochemistry microbiology and chemical engineering .
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Q NO 5

ANS NO 5 :- There are three ways that we uses restriction of endonuclease in the lab .

1)construction of restriction map :- a diagram of DNA molecule of an organism that show specific site of cleavage

- It was one of the first described used of restriction enzymes .
  - It are used to identify the fragment of DNA which contain specific genes
  - It are also designed and engineer cloning vector and plasmid
- 2)construction of DNA finger print :- it is a forensic technique used to identify individually based on the variation in their DNA sequences .
- Many method are now available for DNA finger printing and the most accurate one is DNA sequencing based method .
  - Restriction enzymes are also used to construct DNA finger print .
  - This difference in the restriction map is because of there difference in the DNA sequences .
  - Since the restriction enzymes are sequences specific in there in the action .
  - The region of DNA an on organism that are highly variable on restriction digestion generate unique DNA finger print .
  - Such DNA finger print are extensively used in solving paternity dispute ,identification of suspects forensic sciences etc .

3)recombinant DNA TECHNOLOGY :- the first recombinant DNA was produced by Stanley N .Cohen and Herbert Boyer in 1973.

- In their experiment ,they combined two plasmids PSC-101 and PSC- 102 and the newly created recombined DNA were incorporated into E.CO/I .
- The PSC 101 contain the gene for tetracycline resistance.
- The PSC 102 contain the gene for kanamycin resistance.
- The transformed bacteria after recombination show resistance to both these antibiotics
- Many diverse techniques are now available in recombinant DNA technology .



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