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**Subject: Biology**

**Topic: Biotechnology**

**M.M. 240 COMPETITIVE TEST**  **Time: 60 Min.**

1. An enzyme catalyzing the removal of nucleotides from the ends of DNA is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) DNA ligase | b) Exonuclease | c) Endonuclease | d) Chitinase |

1. Restriction in restriction endonuclease refers to :

|  |  |
| --- | --- |
| a) Preventing of the multiplication of bacteriophage in bacteria | b) Producing sticky ends |
| c) Cleaving the phosphodiester bond in DNA by the enzyme | d) Cutting of DNA at specific position |

1. Which of the following is not a source of restriction endonucleases?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Escherichia coli | b) Haemophilus influenza | c) Arthrobacter luteus | d) Entamoeba histolytica |

1. The specific DNA sequence where EcoRI cuts is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) GGATCC | b) GATACC | c) GAATTC | d) GTTAAG |

1. Which of the following enzyme is used to remove the phosphate group from the 5’ end of a DNA molecule, leaving a free 5’ hydroxyl group?

|  |  |  |  |
| --- | --- | --- | --- |
| a) DNA ligase | b) DNA polymerase | c) Alkaline phosphatase | d) restriction endonuclease |

1. Which of the following is correctly matched?

|  |  |
| --- | --- |
| a) pBR322 – Enzyme | b) EcoRI – Plasmid vector |
| c) Agrobacterium – Production of insulin | d) Ligase – Molecular glue |

1. A cloning vector should have

|  |  |  |  |
| --- | --- | --- | --- |
| a) selectable marker | b) Origin of replication | c) Restriction sites | d) all of these |

1. In case of EcoRI R represents,

|  |  |  |  |
| --- | --- | --- | --- |
| a) Genus | b) species | c) strain | d) order of discovery |

1. The substrate for restriction enzyme is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) RNA | b) cell membrane protein | c) cellulose | d) Double stranded DNA |

1. Which of the following bacterium is considered a natural genetic engineer?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Thermus aquaticus | b) E.coli | c) Agrobacterium tumefaciens | d) Haemophilus influenza |

1. In Agrobacterium, the part of Ti Plasmid transferred into plant cell DNA is called as :

|  |  |  |  |
| --- | --- | --- | --- |
| a) mRNA | b) cDNA | c) T DNA | d) origin of replication |

1. The crown gall tumor inducing capacity of Agrobacterium tumefaciens is located in extrachromosomal portion called

|  |  |  |  |
| --- | --- | --- | --- |
| a) lambda phage | b) M 13 phage | c) Ti plasmid | d) pBR322 |

1. The method of injecting a recombinant DNA into the nucleus of an animal cells is

|  |  |
| --- | --- |
| a) microinjection | b) Gene gun |
| c) biolistic method | d) Chemical mediated gene transfer |

1. Plasmid are suitable vectors for gene cloning because ;

a) These are small circular DNA molecules which can integrate with host chromosomal DNA

b) These are small circular DNA molecules with their own replication origin sites

c) These can be shuttle between bacteria and virus

d) They regulate cell division in bacteria

1. An antibiotic resistance gene in a vector usually helps in the selection of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Transformant cell | b) Competent cell | c) Plant cell | d) Bacteria cell |

1. Biolistic gun / gene gun is suitable for :

|  |  |
| --- | --- |
| a) Transformation of plant cell | b) Introducing genes to animal cell |
| c) DNA fingerprinting | d) Disarming pathogen vectors |

1. All of the following are characteristics of ideal vector, except

|  |  |
| --- | --- |
| a) multiple cloning sites | b) presence of origin of replication |
| c) Large size | d) presence of selectable marker |

1. Which of the following statement is incorrect with respect to gel electrophoresis?

a) DNA fragments are separated according to their size.

b) Bright orange coloured bands are seen after staining DNA with ethidium bromide

c) The most common used matrix is agarose gel

d) DNA fragments move towards cathode under electric field

1. Which of the following statement is incorrect regarding restriction endonuclease?

a) Restriction endonuclease are synthesized by bacteria as part of their defense mechanism

b) Used as tool for recombinant DNA technology

c) Restriction enzymes inspect the length of DNA sequence and cuts at specific site.

d) 230 restriction endonuclease have been isolated from 900 strains of bacteria

1. In E.coli cloning vector pBR322, the restriction sites of antibiotic resistant gene tetR are

|  |  |  |  |
| --- | --- | --- | --- |
| a) EcoRI and Cla I | b) Bam HI and Sal I | c) Pst I and Pvu I | d) EcoRII and Hae III |

1. The process of extraction of DNA from agarose gel matrix is called:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Transformation | b) Elution | c) microinjection | d) electroporation |

1. PCR technique was invented by:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Alec Jeffery’s | b) Kary Millus | c) Kornberg | d) Arber |

1. PCR proceeds in three distinct steps governed by temperature, and are in order of :

|  |  |
| --- | --- |
| a) Extension , Annealing , Denaturation | b) Annealing , Extension , Denaturation |
| c) Denaturation , Annealing , Extension | d) Denaturation , Extension , Annealing |

1. The application of polymerase chain reaction is :

a) To replicate RNA sequence

b) Obtain recombinant protein for commercial use

c) To replicate specific DNA sequence

d) Used to harvest stem cells

1. Denaturation in PCR is done at :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 72˚C | b) 96˚C | c) 65˚C | d) 80˚C |

1. After the completion of biosynthetic pathway, the processes which include separation and purification, are collectively called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) upstream processing | b) downstream processing | c) Hybridization | d) Transformation |

1. While isolating DNA from organism, which of the following enzyme is not used?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Cellulase | b) Chitinase | c) Lysozyme | d) Deoxyribonuclease |

1. Bioreactors are vessels used for :

a) Polymerase chain reaction

b) Thermonuclear reaction

c) Converting raw materials biologically into specific products using microbes, plants and animals cells

d) Detection of specific mutations in genetic disease

1. Which of the following is not a component of downstream processing?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Separation | b) purification | c) expression | d) Preservation |

1. Stirred tank bioreactors are designed for

|  |  |
| --- | --- |
| a) Addition of preservatives to the product | b) Ensuring anaerobic conditions in the culture vessel |
| c) Purification of product | d) Availability of oxygen throughout the process |

1. The polymerase chain reaction is a technique that is used for :

|  |  |
| --- | --- |
| a) In vitro synthesis of mRNA | b) In vivo synthesis of DNA using Taq polymerase |
| c) In vitro synthesis of DNA using Taq polymerase | d) In vivo synthesis of mRNA |

1. During amplification process in PCR technique, Taq polymerase is used between

|  |  |
| --- | --- |
| a) denaturation and Extension | b) annealing and Extension |
| c) Extension and amplification | d) it is not used in PCR |

1. in the first artificial cloning vector pBR322, Letter ‘B’ and ‘R’ represents:

a) Strain of bacteria from which plasmid was obtained

b) Name of scientists Bolivar and Rodriguez who constructed this plasmid.

c) Name of countries Bolivia and Russia who collaborated in constructing this plasmid.

d) Name of laboratory where the plasmid was constructed

1. Which of the following is incorrect regarding pBR322?

a) It was the first artificial cloning vector constructed in 1977

b) It was constructed by Bolivar and Rodriguez

c) It has resistance genes for antibiotics ampicillin and tetracycline

d) Two unique sites Pst I and Pvu I are located within tetracycline resistance gene

1. Which of the following is not correct about plasmid:

a) It is an extrachromosomal DNA in bacteria

b) They are present in one or several copies

c) They are linear single stranded DNA fragments

d) Transfer of plasmid can be done from one cell to another and make several copies of itself

1. The linkage of antibiotic resistance gene with the plasmid vector became possible within :

|  |  |  |  |
| --- | --- | --- | --- |
| a) DNA polymerase | b) Exonuclease | c) DNA ligase | d) Endonuclease |

1. Gel electrophoresis is used for :

|  |  |
| --- | --- |
| a) construction of r-DNA by joining cloning vector | b) isolation of DNA molecule |
| c) Cutting of DNA into fragments | d) Separation of DNA fragments according to their size |

1. DNA or RNA segment tagged with a radioactive molecule is called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Vector | b) probe | c) clone | d) plasmid |

1. There is a restriction endonuclease called EcoRI. What does ‘co; part in it stand for?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Coli | b) colon | c) coelom | d) coenzyme |

1. For transformation, micro-particles coated with DNA to be bombarded with gene are made up of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) silicon or platinum | b) gold or tungsten | c) silver or platinum | d) platinum or zinc |

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

a) Non-recombinant bacteria containing beta galactosidase

b) Insertional inactivation of alpha galactosidase in non-recombinant bacteria

c) Insertional inactivation of alpha galactosidase in recombinant bacteria

d) Inactivation of galactosidase enzyme in recombinant bacteria

1. Golden rice is a genetically modified crop plant, where the incorporated gene is meant for biosynthesis of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) vitamin A | b) vitamin B | c) vitamin C | d) Omega 3 |

1. Which of the following is not a feature of plasmid?

|  |  |  |  |
| --- | --- | --- | --- |
| a) independent replication | b) Circular structure | c) Transferable | d) Single stranded |

1. Which of the following is a RESTRICTION ENDONUCLEASE?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Hind II | b) protease | c) DNase | d) RNases |

1. The DNA fragments separated on an agarose gel can be visualized after staining from

|  |  |  |  |
| --- | --- | --- | --- |
| a) Acetocarmine | b) Aniline blue | c) ethidium bromide | d) Bromophenol blue |

1. DNA fragments are :

|  |  |
| --- | --- |
| a) Negatively charged | b) Neutral |
| c) Either positively or negatively charged depending on size | d) positively charged |

1. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis?

|  |  |
| --- | --- |
| a) The smaller the fragment size, the farther it moves | b) Positively charged fragments do not move |
| c) negatively charged fragments do not move | d) The larger the fragment size, the farther it moves |

1. In Bacillus thuringiensis, the bacteria itself is not killed by the toxic protein crystals because it is :

|  |  |
| --- | --- |
| a) Not produced by bacteria | b) Present in inactive state in bacteria |
| c) bacteria is resistant to toxin | d) Produced in very less amount in bacteria |

1. The proteins encoded by the genes cry I Ac and cry II Ab control the :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Corn borer | b) Meloidegyne incognitia | c) Cotton bollworm | d) mycobacterium |

1. RNA interference technique is used successfully to control the nematode

|  |  |  |  |
| --- | --- | --- | --- |
| a) Ascarias lumbricoides | b) Meloidegyne incognitia | c) Wucheria Bancrofti | d) Rhabditis |

1. Which among the following is the source of T-DNA?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Thermus aquaticus | b) Haemophilus influenza | c) agrobacterium tumefaciens | d) Pseudomonas putida |

1. RNA interferences involves:

|  |  |
| --- | --- |
| a) Synthesis of cDNA from mRNA | b) Synthesis of mRNA from DNA |
| c) silencing of specific mRNA due to dsRNA | d) Silencing DNA replication |

1. In which of the following crop the ripening of fruit has been delayed by the foreign gene and shelf life has been enhanced?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Bt cotton | b) flavr Savr tomato | c) Tobacco plant | d) Golden rice |

1. GMO has been useful for :

|  |  |
| --- | --- |
| a) Reducing post-harvest losses | b) Enhancing the nutritional value of food |
| c) Making crop more tolerant to abiotic stress | d) All of these |

1. What is true about Bt toxin:

a) Bt protein exists as active toxin in bacillus

b) The inactive protoxin gets activated into active toxin in insect gut

c) Bt toxin prevents DNA replication in infected pest

d) It uses RNAi to check growth of pest

1. Anti sense technique has been used to partially suppress he translation of RNA in case of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Bt cotton | b) golden rice | c) Brassica napus | d) tobacco plant |

1. Human insulin is being commercially produced from a transgenic species of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) mycobacterium | b) Haemophilus influenza | c) Escherichia coli | d) Arthrobacter luteus |

1. Which of the following product obtained by rDNA technology is used for treatment of cancer?

|  |  |
| --- | --- |
| a) platelet derived growth factor | b) interferons |
| c) Humulin | d) Tissue-plasminogen activator |

1. Which of the following gene is defective in patients suffering from severe combined immunodeficiency syndrome?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Adenosine deaminase | b) Transacetylase | c) galactosidase | d) CFTR |

1. - 1 antitrypsin is :

|  |  |
| --- | --- |
| a) used to treat heart attack patient | b) used to treat emphysema |
| c) Used to deliver gene in plant cells | d) used to treat arthritis |

4. The infectious stage of plasmodium that enters the human body is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) | c) | d) |

1. Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid.

|  |  |
| --- | --- |
| a) | b) |
| c) | d) |

1. In which diseases does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?
2. Asthma may be attributed by :