

COURSE CODE: 15B11BI411

MAX. MARKS: 25

COURSE NAME: Genetic Engineering &amp; Genomics

COURSE CREDITS: 04

MAX. TIME: 1.5 HR

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required.*

Q. 1. An EST coding for a portion of a protein with a therapeutic potential has been identified in a plant species. The protein need to be produced on a large scale in a bacterial culture. Design a suitable gene cloning strategy for the production of target protein in a bacterium.

(5.0)

Q. 2. Whole genome sequence of a fungal species is given to you. How would you develop a molecular map based on SSR markers and what would be potential applications of SSRs?

(3.0)

Q. 3. Why several cDNA libraries are constructed for a particular organism? What potential applications of cDNA libraries can be in biotechnology and bioinformatics fields?

(4.0)

Q. 4. A new genetic disorder is recorded in a particular part of India. How would you ensure whether it is due to genetic factors? What genomic strategy would you suggest to develop a DNA diagnostic for early detection of genetic disorder?

(5.0)

Q. 5. Why SNPs are considered to be precise markers? Which SNPs either from genic or non-genic regions are desirable and why?

(3.0)

Q. 6. Differentiate the following:

- i) Genetic/ Physical distance
- ii) DNA probe/ Protein probe
- iii) mRNA/ tRNA
- iv) Gene/ Operon
- v) Western blot/ RT-PCR
- vi) Genomic clone/ cDNA clone
- vii) YAC/ Cosmid
- viii) *E. coli* genome/ Human genome
- ix) Kinase/ Phosphatase
- x) 3'-5' exonuclease/ 5'-3' nuclease

(10x 0.5 = 5.0)