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Total Number of Pages: 02

**B.TECH**  
**PCBT4302**

**5<sup>TH</sup> Semester Regular / Back Examination 2015-16**  
**GENETIC ENGINEERING AND R-DNA TECHNOLOGY**  
**BRANCH: BIOTECHNOLOGY**

**Time: 3 Hours**

**Max marks: 70**

**Q.CODE: T368**

**Answer Question No.1 which is compulsory and any five from the rest.**  
**The figures in the right hand margin indicate marks.**

- Q1 Answer the following questions: (2 x 10)**
- a) Define isoschizomers and isocaudomers with suitable examples?
  - b) The restriction endonuclease *HindIII* recognizes the sequence AAGCTT. If the genomic DNA sequence is cleaved with *HindIII*, what will be the average size of the fragment produced?
  - c) Give a sketch leveling of pBR322?
  - d) What is blue-white screening?
  - e) What is EST? Write down its importance.
  - f) How can you avoid the recircularization of vector after treatment with restriction enzyme?
  - g) Calculate the product yield of a PCR reaction, where the efficiency of PCR is 90%, number of input DNA is 5 and the number of cycle is 20?
  - h) Define DNA foot printing with its application?
  - i) What is fusion protein? Write its importance?
  - j) Define Ribozyme with its importance?
- Q2 a) Explain about Linkers and Adapters? Give notes on conversion adapter? (5)**
- b) What is cloning vector? How DNA can be transferred by using bacteriophage? (5)**
- Q3 a) Write down the steps of PCR. What is anchored PCR? (5)**
- b) Briefly describe southern blotting technique with its applications. (5)**
- Q4 What is gene library? Briefly describe the construction of genomic DNA library with its two methods of screening of recombinants. (10)**
- For 99% chance of isolating a individual sequence from-typical genome using a  $\lambda$  – phage vector, where the average size of cloned fragment is  $2 \times 10^4$  kb and the size of target genome is  $3 \times 10^9$  kb. Calculate the number of independent clones will generate during genomic DNA Library preparation.

- Q5** a) Explain two hybrid assay with its applications. (5)  
b) Write down the principle and process of Sanger's method of sequencing. (5)
- Q6** a) Describe the process of expression of heterologous gene in insects cell. (5)  
b) What is antisense RNA? Explain the mechanism of action of antisense RNA with its application. (5)
- Q7** a) Write down the techniques and process of AFLP. (5)  
b) What are the major techniques used and findings of HGP? (5)
- Q8** **Write short notes on any two:** (5 x 2)  
a) Gene Therapy  
b) Random mutagenesis  
c) DNA Vaccine  
d) Gene knockout technology