M. SC. (BIOTECHNOLOGY) SEM-II (2012 COURSE)(CHOICE BASED CREDIT SYSTEM) : WINTER - 2017

SUBJECT : GENETIC ENGINEERING & APPLICATIONS

Day : **Thursday** Time : **10.00 AM TO 01.00 PM**

Date : **02/11/2017** **W-2017-0969** Max. Marks : 60

N.B.:

1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining questions attempt **ANY TWO** questions from each section.
2) Answers to both the sections should be written in **SEPARATE** answer books.
3) Draw neat and labeled diagrams **WHEREVER** necessary.
4) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 **a)** What are exo and endonucleases? Explain with suitable examples. Add a note on importance of class II restriction enzymes. **[05]**

b) What are special purpose vectors? Explain vectors used to maximize recombinant protein production. **[05]**

Q.2 Write short notes on the following: **[10]**

a) Methylases **c)** Genomic library

b) M13 vectors **d)** Direct gene transfer methods

Q.3 **a)** Explain principle and applications of PCR. Add a note on primers used in PCR. **[05]**

b) Explain in detail different methods used for screening genomic / cDNA library. **[05]**

Q.4 Explain in detail: **[10]**

a) Radioactive and non-radioactive DNA labeling methods.

b) Different λ based vectors. Add a note on cosmids.

SECTION – II

Q.5 Explain in detail: **[10]**

a) Importance of *Saccharomyces cerevisiae* in genetic engineering. Add a note on vectors based on 2μ plasmid.

b) Applications of genetic engineering in agriculture.

Q.6 Write short notes on the following: **[10]**

a) Automated sequencing **c)** Analysis of translation product

b) Restriction mapping **d)** Reporter genes

Q.7 **a)** What is site directed mutagenesis(SDM)? Explain different methods for SDM. **[05]**

b) Compare and contrast recombinant protein expression form *E.coli*, yeast and animal cells. **[05]**

Q.8 Elaborate: **[10]**

a) Any two methods of transcript analysis.

b) Sanger's method of sequencing with suitable diagram.

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