M. Sc. (Biotechnology) Sem-II (2012 Course)(Choice Based Credit System) : SUMMER - 2019

SUBJECT : GENETIC ENGINEERING & APPLICATIONS

Day : Thursday
Date : 04/04/2019

S-2019-1410

Time : 02.00 PM TO 05.00 PM
Max. Marks : 60

N.B.:

1) **Q.No.1** and **Q.No.5** are **COMPULSORY**. Out of the remaining questions attempt **ANY TWO** from Q.No. 2, 3, 4 and **ANY TWO** from Q.No. 6, 7, 8.
2) Answers to both the sections should be written in SAME answer books.
3) Draw neat and labeled diagrams **WHEREVER** necessary.
4) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 Write the principle of **ANY FIVE** of the following: **[10]**

a) Real time PCR
b) Agarose gel electrophoresis
c) Purification of phage DNA
d) α – complementation
e) Southern blotting
f) Non-radioactive labeling

Q.2 Explain in detail: **[10]**

a) Restriction-modification systems.
b) Different methods for cDNA library construction.

Q.3 Elaborate: **[10]**

a) Plasmid vectors
b) Vectors for cloning in animal cells

Q.4 Write short notes on: **[10]**

a) DNA labeling techniques
b) Methylases
c) Vectors for cloning in plants
d) Direct gene transfer techniques
e) Genomic library screening techniques

SECTION – II

Q.5 Answer the following (**ANY FIVE**): **[10]**

a) What are YAC vectors?
b) What is the principle of restriction mapping?
c) What are the problems in synthesis of recombinant proteins in *E.coli?*
d) Enlist the applications of mutagenesis technique.
e) Enlist different methods of sequencing.
f) Comment on strong promoters in fungi.

Q.6 Explain in detail: **[10]**

a) Principle of Sanger's method of sequencing.
b) Recombinant protein production in insect cells

Q.7 Answer the following: **[10]**

a) What is transcript analysis? What are different methods for transcript analysis? Explain in detail use of primer extension technique for transcript analysis.
b) Discuss the applications of genetic engineering techniques in crop improvement.

Q.8 Write short notes on: **[10]**

a) Pyrosequencing
b) Mutagenesis by PCR
c) Reporter genes and deletion analysis
d) Applications of genetic engineering techniques in disease diagnosis.
e) Applications of DNA fingerprinting techniques

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