Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**

PBT5I101

5th Semester Regular/Back Examination 2018-19
GENETIC ENGINEERING
BRANCH : BIOTECH
Time : 3 Hours
Max Marks : 100
Q.CODE : E293

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.
The figures in the right hand margin indicate marks.

Part- I

Q1 **Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) What is cloning?
b) What is blue-white colony screening?
c) What is SYBR green and where is it used?
d) What are expression vectors?
e) How can we visualize the DNA within the gel?
f) What advantages do phase vectors have over plasmid vectors?
g) What do you mean by contig library?
h) What is DNA hybridization?
i) Write the advantages of YAC vector.
j) What is si RNA?

Part- II

Q2 **Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Differentiate between touch down and multiplex PCR.
b) What is DNA fingerprinting?
c) What characteristics must a cloning vector have?
d) How are insert (donor) DNA and vector (recipient) DNA molecules spliced together?
e) How are DNA microarrays or chips constructed and used to analyze gene expression? What sorts of things can be learned by this approach?
f) What is a cDNA library? How is a cDNA synthesized? How are cDNA sequences used to help annotation of a sequenced genome?
g) Explain how gel electrophoreses can be used to determine the sizes of the fragments produced by a restriction digest or the size of a PCR product.
h) How does pyrosequencing differ from dideoxy chain-termination sequencing? What advantages does it have for large-scale sequencing projects?
i) How is donor DNA obtained for cloning experiments?
j) What are the implications of Human genome project and its outcome towards genomic research?
k) What are recombinant and subunit vaccines and write their advantages?
l) What do you mean by gene knock-out technique? Schematically represents the technique?

Part-III
Long Answer Type Questions (Answer Any TWO out of FOUR)

Q3 How does the Sanger technique work for sequencing DNA molecules? Discuss how Sanger's method led to the development of automatic sequencers. **(16)**

Q4 Give a concise account of different kinds of vectors available for gene cloning. Discuss the use of plasmids and viruses for this purpose under different conditions. **(16)**

Q5 What are PCR and RAPD (rapid)? Discuss their roles in preparing molecular genetic maps. Describe relative advantages and disadvantages of RFLPs and RAPDs in molecular mapping. **(16)**

Q6 What is meant by a DNA clone, and what materials and steps are used to clone genomic DNA? **(16)**