# **Question Paper**

Exam Date & Time: 02-May-2019 (02:00 PM - 05:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

## INTERNATIONAL CENTRE FOR APPLIED SCIENCES IV SEMESTER B.Sc. (Applied Sciences) in Engg. END SEMESTER THEORY EXAMINATION APRIL/MAY 2019 GENETIC ENGINEERING [IBT 244]

#### Marks: 100

1)

## Duration: 180 mins.

## Answer 5 out of 8 questions.

- A) Show how the Exchange Reaction can be performed using the enzyme, (4) polynucleotide nuclease.
  - B) Which of the two is preferred for including a gene of interest into a cloning (6) vector a linker or an adapter? Justify.
- C) What are the differences between the ori sequences present in prokaryotes <sup>(10)</sup> and eukaryotes? Explain with a schematic.
- What are the molecules separated by Northern and Western hybridization? <sup>(4)</sup>
  What are the probes used for these techniques?
  - <sup>B)</sup> Of the different restriction endonuclease systems available for genetic <sup>(6)</sup> engineering applications, which is the most useful system? Why is it so?
  - C) Consider a plasmid that contains a 3000-bp unknown insert DNA fragment. <sup>(10)</sup> Recognition sites for the enzymes *Kpn* I and *Bam*H I are present within the vector as shown. On digestion with *Kpn* I, we get a 1000 bp and a big fragment. On digestion with *Bam*H I, we get a 600 bp, a 220 bp and a big fragment. On subjecting to a double digest, we get 4 fragments of 600, 1000, 1200 bp size & a big fragment. With this data, determine the locations of *Kpn* I and *Bam*H I in the insert DNA fragment.



Describe a method, each, for the preparation of single-stranded and double- <sup>(6)</sup> stranded DNA probes.

3)

A)

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