Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (BIOTECHNOLOGY)

MAKE-UP EXAMINATIONS, JUNE 2018

SUBJECT: GENETIC ENGINEERING [BIO 2203]

REVISED CREDIT SYSTEM

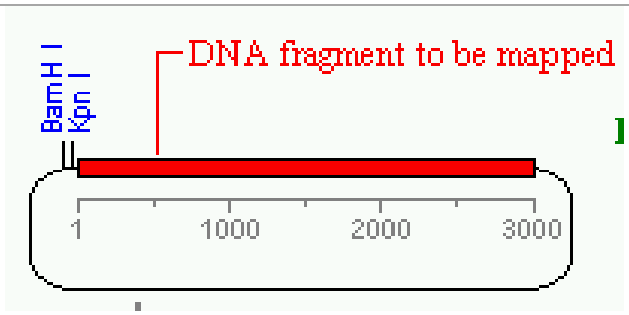
(xx/06/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	Show how the Exchange Reaction can be performed using the enzyme, polynucleotide nuclease.	**2**
1B.	Which of the two is preferred for including a gene of interest into a cloning vector – a linker or an adapter? Justify.	**3**
1C.	What are the differences between the *ori* sequences present in prokaryotes and eukaryotes? Explain with a schematic.	**5**
2A.	What are the molecules separated by Northern and Western hybridization? What are the probes used for these techniques?	**2**
2B.	Of the different restriction endonuclease systems available for genetic engineering applications, which is the most useful system? Why is it so?	**3**
2C.	Consider a plasmid that contains a 3000-bp unknown insert DNA fragment. 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.	**5**

		
3A.	Describe a method, each, for the preparation of single-stranded and double-stranded DNA probes.	**3**
3B.	With a simple schematic, explain how RFLPs are generated by loss of cleavage site(s).	**3**
3C.	Discuss any two chemical-mediated methods for transfection of plant cells.	**4**
4A.	Outline a program for carrying out 30 cycles of PCR in a thermocycler. Indicate the duration and temperature involved.	**4**
4B.	Enlist all the steps followed to create a cDNA library.	**6**
5A.	How can gene therapy be classified? Give a one-line description on each type.	**4**
5B.	What are the different types of plasmids? Write a brief note on each of their applications.	**6**