JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 3 EXAMINATIONS - 2022

M.Sc-II Semester (BT)

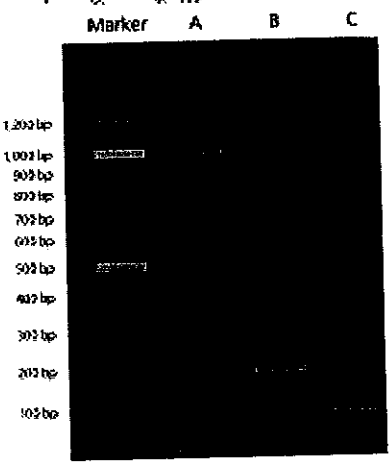
COURSE CODE (CREDITS): **18MS1BT313 (3)** MAX. MARKS: 35

COURSE NAME: **RECOMBINANT DNA TECHNOLOGY**

COURSE INSTRUCTORS: Dr. Rahul Shrivastava MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. A DNA gel electrophoresis picture is provided. Draw restriction profile/map of the gene indicating size of the gene and locations of the restriction enzymes PstII and BamHI. **[3]**



Marker – 100bp DNA ladder
Lane A - Undigested Gene (No treatment)
Lane B – Gene digested with PstII
Lane C - Gene digested with BamHI

Q2. A circular plasmid DNA of 3650 bp when digested with a restriction enzyme shows non-specific, over-digestion (chewing) of the DNA. List possible reasons for such an activity shown by the restriction enzyme. Suggest methods or protocols which may be used to avoid over-digestion of DNA. **[4]**

Q3. Restriction profile of a plasmid vector and a foreign gene insert which needs to be cloned into the vector, are provided. Analyze and interpret the data provided and suggest which restriction site(s) can be used for cloning the insert into the vector. Provide suitable explanation for your choices. **[3]**

	EcoRI	**BamHI**	**EcoRV**	**SmaI**	**HindIII**	**PstI**
Type of cut	**Cohesive**	**Cohesive**	**Blunt**	**Blunt**	**Cohesive**	**Cohesive**
Vector	-	-	+	+	-	+
Insert	+	-	-	+	+	+

(+) Restriction site present within the vector/insert; (-) Restriction site absent within the vector/insert

Q4. Provide a comparative table differentiating genomic DNA library and cDNA library. **[4]**

Q5. An insert of 1Kbp is to be cloned in a vector of 3Kbp. Formulate a cloning strategy which would use a 'Selectable Marker' and a 'Reporter Gene'. Provide suitable examples and utility of 'Selectable Marker' and a 'Reporter Gene' in a cloning protocol. **[5]**

Q6. Describe any two methods with suitable diagrams which may be used for transformation of plant cells. **[5]**

Q7. Write detailed notes on: **(Any Three)** **[3 X 3 = 9]**

a. GM Mustard
b. Golden Rice
c. Bt-Cotton
d. Blue-white screening
e. Cosmids

Q8. A 3Kbp foreign gene needs to be ligated to a 3.3Kbp vector, which may have high chance of self-ligation of insert as well as vector molecules. Evaluate the condition and provide appropriate solution to prevent self ligation so that recombinant vector may be obtained. **[2]**