JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION – MAY - 2023

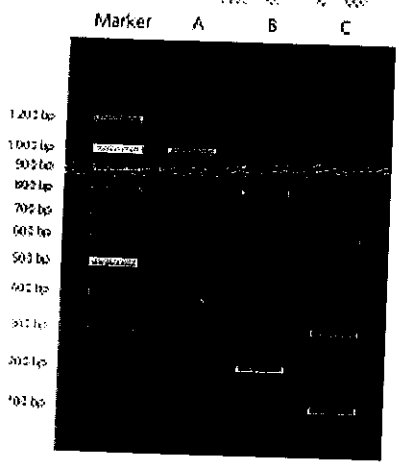
COURSE CODE (CREDITS): 18MS1BT313 (3) MAX. MARKS: 25

COURSE NAME: RECOMBINANT DNA TECHNOLOGY

COURSE INSTRUCTORS: Dr. Rahul Shrivastava MAX. TIME: 1 Hour 30 Minutes

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

Q1. Examine the DNA gel electrophoresis picture provided. Draw restriction profile/map of the gene indicating size of the gene and locations of the restriction enzymes EcoRI and BamHI. **[4]**



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

Q2. 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]**

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

Q3. A 2.0 Kbp foreign gene needs to be ligated to a pUC18 vector. Evaluate the following condition and provide appropriate solution to the problem:

A. To prevent self ligation so that recombinant vector may be obtained instead of self ligated molecules. **[2]**

B. To confirm that vector has been transformed into the competent cells, to obtain recombinant cells. **[2]**

C. To confirm and identify that foreign gene has been inserted into the vector and transformed cells are containing recombinant plasmid. **[3]**

Q4. Provide a comparative table differentiating between different types of ligase on the basis of their source, cofactor requirement, advantages & limitations. **[4]**

Q5. Describe Baculovirus Expression Vector System. Compare are the advantages and disadvantages of using Baculovirus expression vector system. **[4]**

Q6. Provide a flow chart along with a suitable diagram illustrating **Insulin** production using Recombinant DNA Technology. **[3]**