

COURSE CODE (CREDITS): 18MS1BT313 (3)

MAX. MARKS: 25

COURSE NAME: RECOMBINANT DNA TECHNOLOGY

COURSE INSTRUCTORS: Dr. Rahul Shrivastava

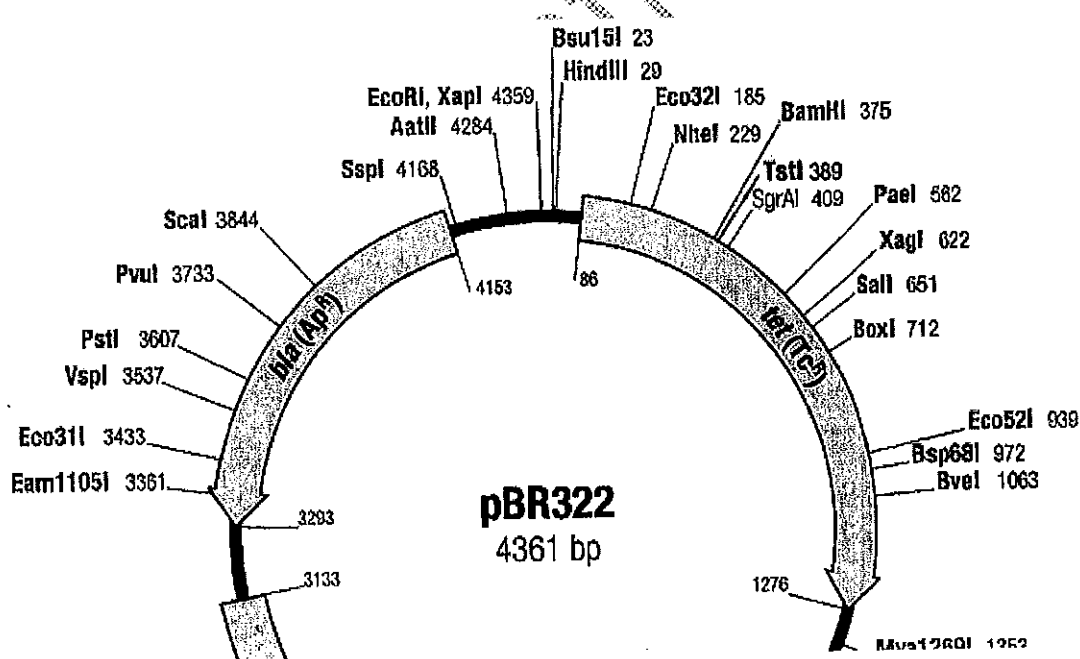
MAX. TIME: 1 Hour 30 Min

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

Q1. You are provided with diagram of a pBR322 vector. The gene for tetracycline (*tet*) was amplified using primers designed from the start and end codon of the gene. [1+1+1+1+2=6]

Calculate the following: (all calculations must be done in fair copy itself).

- Size of PCR product obtained.
- Number and size of products obtained when the amplified product is digested with **BamHI**
- Number and size of products obtained when the amplified product is digested with **BamHI** and **Sall**.
- Number and size of products obtained when the amplified product is digested with **BamHI** and **HindIII**
- Sketch a well labeled agarose gel showing different bands obtained when the PCR product/digested product(s) would be run from a, b, c, and d.



Q2. A DNA fragment of 650 bps has 26 Cytosine bases per 100 molecules. Calculate the amount of Adenine molecules in the DNA fragment. [2]

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	NotI	TaqI	SmaI	XbaI	HindIII	PstI	KpnI
Vector	+	-	+	-	+	+	+	+	-
Insert	-	-	+	+	+	+	-	+	-

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

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

Q5. Prepare a flow chart along with a suitable diagram illustrating **Insulin** production using Recombinant DNA Technology [5]

Q6. Describe any two methods which may be used for transformation of bacterial cells. [5]

T2 Examinations 2022