JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
SUMMER SEMESTER (MID TERM) EXAMINATION- 2018
B.Tech Biotechnology

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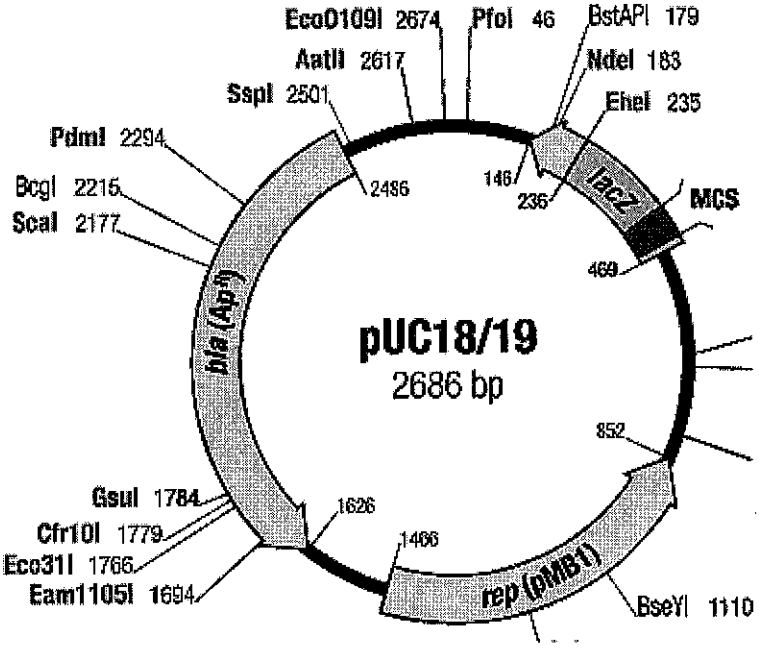
COURSE CODE: 10B11BT513 MAX. MARKS: 50
COURSE NAME: GENETIC ENGINEERING MAX. TIME: 2 HR

Q1. You are provided with diagram of a pUC18/19 vector. The gene for ampicillin resistance (*bla*) was amplified using primers designed from the start and end codon of the gene. **[15]**

Provide the following:

a. Size of the PCR product obtained. [2]
b. Number and size of products obtained when the amplified product is digested with **ScaI.** [2]
c. Number and size of products obtained when the amplified product is digested with **ScaI** and **SspI.** [2]
d. Number and size of products obtained when the amplified product is digested with **ScaI** and **GsuI.** [2]
e. Draw 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. [4]
f. Utility of '*bla*' gene for cloning of insert using the vector. [3]



Q2. How are the following useful in selection of 'insert containing vector' in genetic engineering? **[5 X 3 = 15]**

a. Blue and white screening
b. Selection marker
c. Reporter genes

Q3. What are restriction enzymes? Differentiate between different types of restriction enzymes with examples and their application in Genetic Engineering. **[5]**

Q4. Write Short Notes on: **[3 X 3 = 9]**

a. T4 DNA ligase
b. T4 Polynucleotide Kinase
c. Alkaline phosphatase

Q5. Illustrate the life cycle of M13 filamentous phage and discuss its applications in Genetic Engineering. **[6]**