JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATIONS-2024

B. Tech-IV Semester (BT)

COURSE CODE (CREDITS): 18B11BI412 (3)　　　　　　　MAX. MARKS: 35

COURSE NAME: GENETIC ENGINEERING AND GENOMICS

COURSE INSTRUCTORS: DR JATA SHANKAR　　　　　　MAX. TIME: 2 Hours

Note: (a)All questions are compulsory.

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Q1. What is DNA Microarray? What are the salient features of DNA Microarray and how it works? CO II [3]

Q2. DNA sequencing technology has revolutionized genetic engineering and sequencing technologies are coming up at a rapid pace and advancement. Explain the mechanism of pyrosequencing and why it is called the next-generation sequencing technology. CO II [3]

Q3. Explain the meaning of the alignment of DNA sequences. What is the purpose of alignment in gene prediction or genome sequencing projects? CO III [3]

Q4. Describe Sanger's sequencing and explain the mechanism of Sanger's sequencing and which organism was sequenced first as well as the length of DNA that was determined first. CO II [3]

Q5. Calculate the gen density of E. coli and compare that to the human genome. CO III [3]

Q6. pBR322 is a cloning vector; what is the size of the vector, and what is the mechanism of selecting a recombinant vector? Also, draw the structure pBR322 vector. CO III [3]

Q7. Draw the diagram of the pUC8 vector, highlighting the features of this vector. What is the role of β-galactosidase in the pUC8 vector? CO I [3]

Q8. Describe the DNA modification enzymes such as nucleases, ligase, reverse transcriptase and polymerase and its function in the recombinant DNA technology CO I [4]

Q2. Notes on, CO I & II [Each 2]
    a. ESTs
    b. Physical mapping
    c. 16S rRNA
    d. Structure of Ribose and deoxyribose
    e. SNP