PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
B.Sc., Summer 2017-18 Examination

Semester: 3 & 6   Date: 09/05/2018
Subject Code: 11102201   Time: 10:30am to 1:00pm
Subject Name: Genetic Engineering   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1. A) Explain synthesis of artificial gene using: (08)
    (a) FokI method
    (b) Single step PCR assembly

Q.1. B) Answer the following questions (Any two)
    (a) Define   (04)
        1. RNAi in reverse genetics
        2. Model organism
    (b) Explain control of gene expression.   (04)
    (c) Draw the chemical diagram showing the 4 modifications done on Guanine for performing   (04)
oligonucleotide synthesis.

Q.2. A) Answer the following questions.
    (a) Fill in the blanks.   (04)
        1. PCR Elongation temperature for Pfu is _____ and for Taq is _____.
        2. The full form of RACE is _____
    (b) Give the diagrammatic representation of LAMP PCR.   (04)

Q.2. B) Answer the following questions (Any two)
    (a) Multiple choice questions.   (Each of 01 marks)   (03)
        1. The template for RT PCR is mRNA
        (a) True   (b) False
        2. DNA fingerprinting is not used in the field of forensic science
        (a) True   (b) False
        3. Chromosomal walking is needed if we want to generate physical maps.
        (a)True   (b) False
    (b) Short note: Reversible male sterility in plants using barnase barstar method.   (03)
    (c) Give three applications of cytometry.   (03)

Q.3. A) Explain the following for a standard PCR   (08)
    (a) Components of PCR reaction mix
    (b) Steps of PCR

Q.3. B) Answer the following questions (Any two)
    (a) Define   (04)
        1. Molecular pharming
        2. N terminal sequencing method for proteins
    (b) Compare and contrast between random and site directed mutagenesis.   (04)
    (c) Short note: KO mice and conditional KO using cre-loxP recombinase.   (04)

Q.4. A) Answer the following questions.
    (a) Compare and contrast between ZFN, TALEN and CRISPR.   (04)
    (b) Short note: Western Blotting and its applications   (04)

Q.4. B) Answer the following questions (Any two)
    (a) Multiple choice questions.   (Each of 01 marks)   (03)
        1. ET, SCNT, ART can be used to genetically manipulate animal embryos.
        (a)True   (b) False
        2. Nicotiana is a model _____
        (a) animal   (b) plant
        3. The anticodon for the STOP codon are
        (a) UAA, UAG, UGA   (b) AUU, AUC, ACU
    (b) Draw a detailed flowchart for HPLC MS MS   (03)
    (c) Draw a detailed flowchart for Maxam Gilbert sequencing   (03)