



M.TECH DEGREE EXAMINATIONS: JUNE 2017

(Regulation 2015)

Second Semester

BIOTECHNOLOGY

P15BTT202 : Recombinant DNA Technology

COURSE OUTCOMES

CO1: Demonstrate the steps in cloning and expression of a foreign gene

CO2: Explain and device various gene isolation methods from the selected organisms.

CO3: Describe expression and purification steps involved in recombinant protein products.

CO4: Relate the application of GMOs in medical and Agriculture

CO5: Understand issues related to release of GMO for commercial cultivation India

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The following is the sequence of the steps involved in Agrobacterium mediated transformation of plants CO1 [K₃]
 - i. Attraction of Agrobacterium cells to wounded site
 - ii. Secretion of phenolic compounds
 - iii. Induction of vir genes
 - iv. Transfer of T-DNA into plant
 - v. Attachment of T-DNA into plant chromosome
 - vi. Formation of conjugation tube between Agrobacterium cell and plant cell

a) i-ii-iii-vi-iv-v	b) ii-i-iii-v-iv-vi
c) ii-i-iii-vi-v-iv	d) ii-i-iii-vi-iv-v
2. Which one of the following is suitable host for recombinant human gene expression CO1 [K₃]

a) Insect cell lines	b) Yeast
c) Mammalian cell lines	d) E.Coli
3. Cost of DNA sequencing is reduced due to CO3 [K₃]
 - i. Capillary electrophoresis
 - ii. Laser based base calling
 - iii. Attachment of fluorescent dyes with ddNTPs
 - iv. Attachment of fluorescent dyes with dNTPs

a) i,ii, iii	b) i and iv
c) ii,iii	d) ii and iv

24. Explain the ABC model of flower development and its relevance in male sterile plants. CO2 [K₃]
25. Explain the steps in making thermostable recombinant cellulase by using site directed mutagenesis. CO3 [K₂]
26. Analyse the pros and cons of GMO derived products for human use with suitable examples. CO4 [K₃]

Answer any FOUR Questions

PART D (4 x 10 = 40 Marks)

27. Describe any TWO methods of introducing DNA into bacteria and plant cells with respect to principle, critical steps and advantages. CO1 [K₃]
28. A research scholar is working on a project to express recombinant therapeutic protein (human alpha-1 antitrypsin –AAT) in yeast. Give your critical review about expressing and purifying recombinant AAT in yeast.
(expression vector map(2.5 marks), Cloning Steps (2.5 marks) Recombinant purification steps (5 marks) CO2 [K₄]
29. As a biotechnologist in a R&D unit, you asked been asked to prepare a library to isolate gene which is expressed in kidney. In this situation which type of library you will prepare and describe the critical steps with suitable illustrations. CO3 [K₄]
30. Describe the method of construction of genomic library with suitable illustration. CO4 [K₄]
31. Rice is a staple food crop in India. Many Indian children are affected with “vit A” deficiency. Correlate the above two statements. (2) CO5 [K₄]
How is metabolic engineering of rice for beta- carotene synthesis carried out to extend the metabolic pathway in rice otherwise rice is not having the pathway naturally (8)
