

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY****SECOND SEMESTER – APRIL 2023****PBT2MC02 – RECOMBINANT DNA TECHNOLOGY**

Date: 04-05-2023

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A – K1 (CO1)**Answer ALL the questions****(5 x 1 = 5)****1. Choose the best option**

- a) Which of the following is correct for plasmid pBR322?
i) ampr ii) tetr iii) ampr and tetr iv) HindIII and EcoRI
- b) Vector containing ampicillin and streptomycin resistant gene is used for transformation. Which antibiotics would be the best for selection of transformed bacterial colonies?
i) Ampicillin and streptomycin ii) Ampicillin
iii) Tetracycline and Ampicillin iv) Streptomycin
- c) Sanger's method of DNA sequencing requires
I. ddNTPs II. Primer III. Klenow fragment IV. dNTPs
i) I, II and III ii) I, III and IV iii) II, III and IV iv) All the above
- d) ADA deficiency leads to
i) High levels of deoxyadenosine iii) Killing of T – cells
ii) Killing of B – cells iv) All the above
- e) The right granted by a government to an inventor to prevent others from the commercial use of his/her invention is called _____
i) Piracy ii) Ethics iii) Biosafety iv) Patent

SECTION A – K2 (CO1)**Answer ALL the questions****(5 x 1 = 5)****2. Answer in one or two sentences**

- a) Mention the steps in traditional cloning.
- b) Name any one molecular method used for confirmation of bacterial transformants.
- c) Write the use of dideoxynucleotides.
- d) Distinguish: miRNA and siRNA.
- e) How biotechnological invention can be protected?

SECTION B – K3 (CO2)**Answer any THREE of the following in 300 words****(3 x 10 = 30)**

3. Briefly describe the role of restriction enzymes in rDNA technology.
4. Explain the construction and screening of cDNA library.
5. Illustrate the principle and method of Pyrosequencing in detail.
6. Discuss on the synthesis and significance of Fusion protein over native protein.
7. List and explain some of the key ethical issues faced in Genetic engineering.

SECTION C – K4 (CO3)

Answer any TWO of the following in 500 words

(2 x 12.5 = 25)

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| 8. | Illustrate and explain the process of automated sequencing. |
| 9. | a) Describe the mode of insertion of foreign DNA into host cell with help of diagram (6.5 marks).
b) Give a short note on gene specific and degenerate primers (6 marks). |
| 10. | Cystic fibrosis is a genetic disorder treated via gene therapy. Demonstrate the steps involved with its strength and limitations. |
| 11. | Sketch and elaborate the process of creating a transgenic organism with example. How can we quantify the expression of the 'transgene'? |

SECTION D – K5 (CO4)

Answer any ONE of the following in 750 words

(1 x 15 = 15)

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| 12. | Summarise the steps in PCR amplification and optimisation. |
| 13. | Discuss the importance of promoters and visual markers in genetic engineering. |

SECTION E – K6 (CO5)

Answer any ONE of the following in 1000 words

(1 x 20 = 20)

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| 14. | Elaborate on Next Generation Sequencing and its applications. |
| 15. | GMO's are a boon and a curse to nature and mankind. Justify with relevant examples. |
