

Register Number.....

M.TECH., DEGREE EXAMINATIONS: NOV/DEC 2012

Third Semester

BIO TECHNOLOGY

BTY564: Molecular Therapeutics

Time: Three Hours

Maximum Marks: 100

Answer All Questions:-

PART A (10 x 2 = 20 Marks)

1. Distinguish between ex vivo and in vivo gene therapy
2. What is the danger in using retroviruses to deliver transgenes for gene therapy?
3. Mention the properties and potency of stem cells
4. How do adult stem cells differ from embryonic stem cells?
5. List the clinical applications of human growth hormone.
6. Mention any four recombinants currently used as therapeutics
7. Outline the therapeutic applications of TNF α and IFN $-\gamma$
8. Mention any four enzymes used to treat blood clotting disorders
9. List the 3 ways that microRNAs can repress the expression of their target mRNAs
10. What is the difference between reproductive cloning and therapeutic cloning?

PART B (5 x 16 = 80 Marks)

11. a) (i) Explain the construction of any two viral vectors for gene delivery. (8)
(ii) Describe the procedure for ADA gene therapy. (8)
(OR)
b) (i) Give an overview of inherited and acquired diseases for gene therapy. (8)
(ii) Outline the use of liposomes and nanoparticles as gene delivery vehicles. (8)
12. a) (i) Write the sources and therapeutic applications of embryonic stem cells. (8)
(ii) Elaborate the ethical issues concerned in using stem cells. (8)
(OR)
b) (i) Explain the concept of tissue engineering and its applications. (8)
(ii) Emphasize the role of scaffold and growth factors in tissue engineering. (8)

13. a) (i) Explain the steps involved in the production of a therapeutically important protein by a genetically modified mammalian cell line. (8)

(ii) Elaborate on the strategies used to increase the half life of recombinant therapeutics (8)

(OR)

b) (i) What are the engineering strategies that can be adopted to overcome lack of post translational modifications in E coli during recombinant protein expression? (8)

(ii) How recombinant insulin is engineered to reduce aggregation and inactivation? (8)

14. a) (i) Outline the approaches used for production of humanized monoclonal antibodies. Mention any four applications of monoclonal antibodies. (8)

(ii) Describe the mode of action of any two immune stimulant and immune suppressor drugs. Outline their applications. (8)

(OR)

b) (i) Outline the production and applications of recombinant vaccines with suitable example. (8)

(ii) Outline the use of dendritic cell vaccines for tumor immunotherapy. (8)

15. a) (i) Describe any two strategies used for gene silencing. (8)

(ii) How does RNA interference (RNAi) function to inhibit replication of mammalian viruses? (8)

(OR)

b) (i) What is a transgenic animal? Explain any two methodology used to produce transgenic animals. (8)

(ii) Outline the role of transgenic animals in organ transplantation. (8)
