

GANPAT UNIVERSITY
B. TECH. SEMESTER: VIII (BM&I) ENGINEERING
CBCS REGULAR EXAMINATION APRIL – JUNE 2016
2BM804 TISSUE ENGINEERING (ELECTIVE-I)

TIME: 3 HRS

TOTAL MARKS: 70

- Instructions:** (1) This Question paper has two sections. Attempt each section in separate answer book.
 (2) Figures on right indicate marks.
 (3) Draw diagram wherever required.
 (4) Assume data wherever necessary.

SECTION: I

- Q.1** **12**
- a) What are embryonic stem cells? How embryonic stem cell lines can be obtained? What are its advantages and disadvantages if used as cell source? (6)
- b) Under what circumstances and how bone marrow transplantation is done? (3)
- c) With the help of block diagram explain working principle of tissue engineering. (3)
- OR**
- Q.1** **12**
- a) Define: Primary culture. Describe any two types of cell culture in detail. (5)
- b) Explain the process of senescence which limits cell doublings. Plot and describe different phases of growth cycle. (5)
- c) What is cellular therapy? (2)
- Q.2** **11**
- a) With the help of chart show how Mesenchymal Stem Cells can be differentiated into different Mesenchymal Cell Types? (4)
- b) Enlist and explain different characteristics of connective tissues with its location and function. (4)
- c) What is IPS cells? How it can be used to engineer heart tissue? (3)
- OR**
- Q.2** **11**
- a) Write note on Tissue engineering for skin. (5)
- b) Explain static cell seeding techniques with its disadvantages. Draw neat diagram. (3)
- c) What is cryopreservation? Which factors will favor survival of cryopreserved cells? (3)
- Q.3** **12**
- a) Briefly explain 1) Rotating wall bioreactor 2) Compression bioreactor. (5)
- b) Compare A2 and B2 type Biosafety Class II Cabinet. (3)
- c) Write a note on Fluorescence Activated Cell Sorting. (4)

SECTION: II

- Q.4 12
- a) How cell sheets with self-secreted ECM approach can be used for scaffolding in tissue engineering? Write its advantages and disadvantages. State other major scaffolding approaches. (6)
- b) Which synthetic polymers based scaffolds materials are used popularly? (3)
- c) Write a brief note on types of growth factors. (3)

OR

- Q.4 12
- a) Describe sequences of events that underlie adult wound healing with neat diagram. (5)
- b) How fetal wound healing is different from adult wound healing? (3)
- c) State advantages of controlled drug delivery. Briefly explain major mechanism used for drug delivery. Draw overall kinetics of drug delivery mechanism. (4)

- Q.5 11
- a) Explain Scaffold fabrication methods: a) Gas foaming and b) Melt molding. (6)
- b) Draw neat diagram and explain selective laser sintering (SLS) technology used for Scaffold fabrication. (3)
- c) Giving example explain process of transdifferentiation. (2)

OR

- Q.5 11
- a) Describe process of cell communication through soluble signals. (5)
- b) Write a note on mitotic cycle of cell division. (3)
- c) What are different phases of cell apoptosis? Which biochemical process causes induction of apoptosis? (3)

- Q.6 12
- a) Explain working principle of ducted and ductless fume hood. (4)
- b) Using neat diagram describe working of Electrospinning technique used for Scaffold fabrication. (5)
- c) What design requirements are to be considered for scaffold material selection? (3)

-----END OF PAPER-----