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M.E. / M.TECH. DEGREE EXAMINATIONS, MAY 2019
 Second Semester
BY18028 – TISSUE ENGINEERING AND STEM CELL TECHNIQUES
(Biotechnology)
(Regulation 2018)

Time: Three Hours

Maximum : 100 Marks

Answer ALL questions

PART A - (10 X 2 = 20 Marks)

1. Define TEMP with an example.
2. What is ECM?
3. What are columnar epithelial cells?
4. What is angiogenesis?
5. Define Hay-Flick limit.
6. What are adult stem cells?
7. Define a scaffold with an example.
8. List the functions of nervous tissue.
9. What is PDGF?
10. What is Durotaxis?

PART B - (5 X16 = 80 Marks)

11. (a) (i) Describe the importance of cell culture in tissue engineering. (8)
- (ii) How will you produce a primary cell culture? (8)
- (OR)**
- (b) (i) Describe the basic equipments used in a tissue culture facility. (8)
- (ii) Explain the rules of working in a tissue culture facility. (8)

12. (a) (i) Explain cell migration processes. (8)
- (ii) Describe cell function assays. (8)
- (OR)**
- (b) (i) How will you test the tissue performance following a mechanical force? (8)
- (ii) Describe the therapeutic applications of cells with examples. (8)

13. (a) (i) Describe the biomaterials used in tissue engineering. (10)
(ii) How is the mechanical properties of biomaterials tested. (6)

(OR)

- (b) (i) Describe the surface modifications that can be done on biomaterials and its importance. (8)
(ii) Explain the applications of nanotechnology in tissue engineering. (8)

14. (a) (i) Describe the embryonic stem cells and their characteristics. (8)
(ii) Describe the ethical issues associated in tissue engineering and its applications. (8)

(OR)

- (b) (i) Describe mesenchymal stem cells and their characteristics. (8)
(ii) Discuss the patenting of stem cell technology. (8)

15. (a) **Write notes on**
(i) Mechanisms of wound healing. (8)
(ii) Healing a injured heart by tissue engineering. (8)

(OR)

- (b) **Write notes on**
(i) Development of a cartilage by tissue engineering. (8)
(ii) Preservation of cells for tissue engineering applications. (8)