

GANPAT UNIVERSITY
B.TECH. 8TH SEM BIOMEDICAL AND INSTRUMENTATION ENGINEERING
REGULAR EXAMINATION MAY/JUNE 2014
2BM804: TISSUE ENGINEERING (OPEN ELECTIVE)

TIME: 3 HOURS**TOTAL MARKS: 70****INSTRUCTIONS:**

1. Use separate answer sheets for the two sections
2. Figures on the right side indicate marks
3. Please explain with the help of diagram wherever it is necessary

SECTION – I

- Que.1** Write answers of the following questions. 12
- A Explain the need of tissue engineering.
- B Explain the role of stem cell in tissue engineering.
- C Write a note on phase contrast microscopy.

OR

- Que.1** Write answers of the following questions. 12
- A Explain in detail the apoptosis.
- B Write a note on fiber bonding technique of scaffold synthesis.
- C Explain the collagen based vessel construct.

- Que.2** Write answers of the following questions. 11
- A Write a note on extracellular matrix.
- B Explain the growth kinetics of cells in culture.

OR

- Que.2** Write answers of the following questions. 11
- A Explain in short various parameters to determine the cell differentiation.
- B Compare and contrast all the strategies of growth factor delivery.

- Que.3** Write answers of the following questions. 12
- A How tissue engineering works?
- B Explain the cell microenvironment.
- C Write a note on telomeres and self-renewal in stem cells.

SECTION - II

- Que.4** Write answers of the following questions. 12
- A Describe briefly the development of tissues in human embryo. What is stem cell and what is its function in an organism.
- B Write note on Marrow Stroma and its support to different lineage pathways. How in-vivo and in-vitro micro-environment can influence Mesenchymal stem cells (MSCs).
- C Define: 1) Progenitor cell 2) Graft
- OR**
- Que.4** Write answers of the following questions. 12
- A Giving examples of in-vivo cartilage formation prove that study of embryonic tissue formation is required in order to repair/regenerate tissue.
- B Write steps for formation of bone from Demineralised bone matrix (BMPs). Mention BMPs threshold concentrations required in this process. Give Example of BMPs with their function.
- C Define: 1) Adult stem cells 2) Morphogenesis
- Que.5** Write answers of the following questions. 11
- A Which physical delivery methods are used to deliver gene into selected cells. How non-viral gene delivery complexes can be transported within the cytoplasm and nucleus.
- B What is Cellular Cardiomyoplasty and Write the design considerations required for successful cardiac tissue engineering.
- OR**
- Que.5** Write answers of the following questions. 11
- A Explain burn wounds. Describe various compositions used as skin substitute. write the limitations of bioengineered skin substitute
- B Explain delivery of drugs to cells or tissues by use of cell carriers
- Que.6** Write answers of the following questions. (Any 3) 12
- A Write normal wound healing procedure. Enumerate the functions of Platelet Derived GFs.
- B Which are the two fundamental types of bone deformities? How deformity can be repaired using surgical graft.
- C Write note on cartilage tissue engineering.
- D Describe the role of Basic fibroblast GF as angiogenic factor.

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