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MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

II SEMESTER M. TECH (BME) DEGREE MAKE UP EXAMINATIONS, JUNE 2018

SUBJECT: TISSUE ENGINEERING (BME 5239)
(REVISED CREDIT SYSTEM)

Saturday, 23rd June 2018 : 2 PM to 5 PM

TIME: 3 HOURS

MAX. MARKS: 100

Instructions to Candidates:

Answer all the five full questions.

- 1A.** Classify different types of cells by their source. Explain the basic components of connective tissues. **5+5**
- 1B.** Write down the principles of dry heat sterilization, moist heat sterilization and gamma ray sterilization. **6**
- 1C.** What are the functions of HEPA filter and membrane filters? **4**
- 2A.** Write down the development of heart during embryogenesis (highlight the role of germ layers). **8**
- 2B.** Explain the working of an autoclave. **6**
- 2C.** Explain the basic steps associated in cell signaling process. **6**
- 3A.** Classify different germ layers. **4**
- 3B.** What is 'neural crest cell'? Explain cellular signaling steps associated in keratinocyte proliferation (be specific with the answer). **2+4**

- 3C.** Explain the following stages of cell signaling of skin (highlight the role of different factors): **10**
- (i) Hemostasis and inflammation (ii) proliferation and (iii) remodeling.
- 4A.** Compare ‘symmetric’ and ‘asymmetric’ stem cells divisions. Discuss factors regulating asymmetric stem cell division. **6**
- 4B.** Classify and explain stem cell niche. **6**
- 4C.** Explain the steps associated in the isolation of mouse embryonic stem cells. **8**
- 5A.** Mention the major components of tissue culture medium with purpose. **4**
- 5B.** Discuss the major components of cartilage. Explain the steps involved in Autologous Chondrocyte Implantation. **10**
- 5C.** Explain different gradient centrifugation techniques for cell selection. **6**