Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

VII SEM B.TECH (BME) DEGREE MAKE UP EXAMINATIONS DEC/JAN 2015-16

SUBJECT: TISUUE ENGINEERING [BME 431]

REVISED CREDIT SYSTEM

Sunday, 3rd January 2016: 2pm-5pm

Time: 3 Hours **MAX. MARKS: 100**

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions

1A.	Categorize cells by their source.	**4**
1B.	Write down the working of an autoclave. Compare the principle involved in 'dry heat sterilization' and 'moist heat sterilization'.	**8**
1C.	How do hypotonicity and hypertonicity help in sterilization? Explain the role of membrane filters in the sterilization process.	**8**
2A.	Write down the development of heart during embryogenesis (highlight the role of germ layers)	**8**
2B.	Explain the working of a gamma ray irradiator.	**6**
2C.	Explain the "gene activation" process in cell signaling.	**6**
3A.	What is the role of vasculo-endothelial growth factor in angiogenesis? Explain the working of an anti-VEGF therapy in cancer management.	**3+3**
3B.	What is 'interleukin'? Analyze the function of different components in keratinocyte proliferation (be specific with the answer).	**1+4**
3C.	Explain the following stages of cell signaling of skin (highlight the role of different factors): (i) Hemostasis and inflammation (ii) proliferation and (iii) remodeling.	**9**
4A	Classify and explain stem cell niche.	**6**

4B.	Explain the steps associated in the isolation of mouse embryonic stem cells.	**8**
4C.	Differentiate pluripotent and multipotent stem cells. Discuss factors regulating asymmetric stem cell division.	**6**
5A.	Explain different gradient centrifugation techniques for cell selection.	**8**
5B.	What is "porogen"? How does it help in making porous scaffold? Explain.	**2+4**
5C.	How do you prepare feeder cell layer? Highlight its advantage in stem cell isolation.	**3+3**
6A.	Highlight different ligand and receptors present in PDGF.	**4**
6B.	Explain the autologous chondrocyte transplantation procedure in cartilage tissue engineering.	**8**
6C.	Mention the role of the following components in culture medium: (i) Sodium chloride, (ii) amino acid, (iii) phenol red, (iv) antibiotics.	**8**