

Roll No.

Total No. of Pages : 01

Total No. of Questions : 08

**M.Tech.(Bio Tech.) (Sem.-2)**  
**STEM CELL TECHNOLOGY**  
Subject Code : MTBT-110  
Paper ID : [E0916]

Time : 3 Hrs.

Max. Marks : 100

**INSTRUCTION TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

- Q1 a) Explain the properties of embryonic stem cells. What are the markers found to be expressed in ES cells?  
b) Explain hematopoiesis and also the different markers expressed in HSCs.
- Q2 a) Explain the LIF-pathways involved in the maintenance of Differentiation and Self renewal of ESC.  
b) Explain about the transcriptome profiling of embryonic stem cells.
- Q3 What are the different properties, markers and the clinical application of Mesenchymal stem cells?
- Q4 a) Explain in detail the ethics and important law policies that are constituted for the use of stem cells in biomedical research.  
b) What are the uses of hematopoietic stem cells in medical applications?
- Q5 a) Explain how would you experimentally show that embryonic stem cells are TRULY PLURIPOTENT?  
b) What are the applications of stem cells in the area of liver disorders?
- Q6 a) Explain the niche of stem cells found in the epithelium in the small intestine.  
b) Explain the following :  
a. SSEA  
b. CXCR4-SDF1  
c. CD34  
d. Oct4  
e. Telomerase
- Q7 Explain in detail about the differentiation of stem cells into neurons.
- Q8 Write short notes on :  
a) Epigenesis of stem cells.  
b) Stem cell plasticity.