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M.Tech.(Bio Tech.)EL-I (2018 Batch) (Sem.–1)

STEM CELL TECHNOLOGY

Subject Code : MTBT-105-18

M.Code : 75765

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1.Attempt any FIVE questions out of EIGHT questions.

2.Each question carries TWELVE marks.

1. a) What are embryonic stem cells (ESC)? Explain the various properties exhibited by ESC. What are the different markers present on ESC cells?

   b) Describe how would you use FACS method for the isolation of stem cells?

2. a) Explain how would you culture embryonic stem cells and keep them growing in the undifferentiated state?

   b) Write briefly about the different policies and ethics related to use of stem cells in regenerative medicine

3. Explain the repopulating pattern of hematopoietic stem cells (HSCs). Also describe the different markers expressed in primitive HSCs and in differentiated HSCs.

4. a) Describe the properties exhibited by Mesenchymal stem cells. Also explain the different markers found in these cells.

   b) Explain how stem cells can play an important role for the treatment of neural disorders?

5. a) What is cellular reprograming? What are the different transcription factors and their properties for inducing pluripotency?

   b) Describe the stem cell niche and microenvironment present in the small intestine region.

6. a) Explain in detail the transcriptome profiling of embryonic stem cells.

   b) Write about the different types of adult stem cells.

7. Write notes on the following :

   a) Embryonal carcinoma cells.

   b) Plasticity of hematopoietic stem cells.

8. Explain how would you use induced pluripotent stem cells for the treatment of diabetes and cardiovascular diseases?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.