

Roll No.

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M.Tech.(Bio Tech.) (Sem.-1)
STEM CELL TECHNOLOGY

Subject Code : MTBT-105-18

M.Code : 75765

Date of Examination : 19-01-2023

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 the different properties of stem cells and also describe the different types of stem cells?
 - b) Explain the stem cell niche in colon region?
2.
 - a) What are the epigenetic signatures i.e. role of DNA methylation and histone modification of stem cells?
 - b) Describe the properties of Hematopoietic Stem Cells (HSC). What are the different markers present in primitive HSC and differentiated HSC?
3. Describe in detail how can you regulate the differentiation of Embryonic Stem Cells (ESC) into Neuron cells.
4.
 - a) Explain the criteria of pluripotency for cells. Also write how you would demonstrate pluripotency both *in-vitro* and *in vivo*.
 - b) What are the markers expressed in Mesenchymal Stem Cells (MSC). How would you isolate MSC's from the bone marrow microenvironment?
5.
 - a) Describe how does Leukemia Inhibitory factor (LIF) help to control the process of differentiation of embryonic stem cells.
 - b) Explain the role of stem cells for treatment of skin diseases and burn victims.

6. Write explanatory notes on:

- a) Separation techniques of stem cells
 - b) Epigenesis in pluripotent stem cells.
7. a) Explain ethics and laws of using embryonic stem cells for treatment of human diseases.
- b) Explain how would you use stem cells for the treatment of liver diseases?
8. a) Describe the application of mesenchymal stem cell in area of regenerative medicines.
- b) What is throphoblast stem cell? Describe the origin of throphoblast cells.

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.