

**M.Sc. REGENERATIVE MEDICINE DEGREE EXAMINATION**

**(2013-2014 Batch onwards)**

**SECOND YEAR**

**PAPER II – STEM CELL AND TISSUE ENGINEERING**

***Q.P. Code : 281512***

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**I. Elaborate on:**

**(2 x 20 = 40)**

1. Compare and contrast between naturally occurring pluripotent stem cells and induced pluripotent stem cells. Differentiate between hematopoietic stem cells and mesenchymal stem cells especially with reference to isolation and culture techniques.
2. A successful artificial organ production involves an integrated approach of various subspecialties including stem cells culture techniques; cell-extracellular matrix interaction, tissue engineering, Bioprinting; Immunoisolation and tissue delivery. Describe briefly each of these techniques with respect to regeneration of a kidney.

**II. Write Notes on:**

**(10 x 6 = 60)**

1. State 3 advantages and 3 disadvantages using stem cells to grow replacement body parts for human beings.
2. Describe how a serial passage of suspension cell culture is carried out.
3. Describe the role of glycoaminoglycans in extracellular matrix.
4. Decellularised tissue scaffolds- Methods of preparation and advantages.
5. Briefly classify stem cells based on their potency.
6. Draw a stirred bioreactor and label the location of tissues and various components.
7. Describe the technical principle involved in 'in-vitro' tissue engineering and list its merits.
8. Stem cells in heart diseases- describe its usefulness and enumerate some trials.
9. Current regeneration strategies being attempted to treat Diabetes Mellitus.
10. Compare and contrast autologous hematopoietic stem cells transplant with allogenic hematopoietic stem cell transplant.

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