

Total No. of Questions : 12]

SEAT No. :

P1134

[4659]-361

[Total No. of Pages :3

B.E. (Biotechnology)

**c - STEM CELLS AND REGENERATIVE MEDICINES
(2008 Course) (Elective -II) (Semester - I) (415462)**

Time : 3Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4 Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data if necessary.*
- 5) *Use of lagarithmic tables, slide rules, Mollier charts, electronic pocket calculator and steam table is allowed.*

Q1) Answer the following (9 marks each): **[18]**

- a) Explain the properties of Embryonic stem cells important for regenerative medicine.
- b) Define the following with examples:
Progenitor cells, Transit amplifying cells, Totipotent cells.

OR

Q2) Answer the following (9 marks each): **[18]**

- a) What are stem cells? Explain the general properties of stem cells in details.
- b) What are the potential advantages of Embryonic stem cells as compared to adult stem cells for therapeutic application?

Q3) Discuss the following techniques used in stem cell biology in details: **[16]**

- a) Chromatin immunoprecipitation.
- b) DNA sequencing.

OR

Q4) Describe briefly the principle, working and application of fluorescence activated cell sorting. **[16]**

P.T.O.

Q5) Briefly explain the following: [16]

- a) Blood cells differentiation from Hematopoietic stem cells.
- b) Types of multipotent cells present in nervous system.

OR

Q6) Briefly explain the following: [16]

- a) Mechanisms of liver regeneration.
- b) Somatic cell nuclear transfer.

SECTION-II

Q7) With the help of neat labeled diagram explain the isolation and culture of human ESCs from blastocysts. [16]

OR

Q8) Discuss the following: [16]

- a) Guidelines for translational stem cell research for cell processing and manufacturing.
- b) Clinical application of umbilical chord blood stem cells.

Q9) Describe the causes, symptoms, diagnosis and treatment for Parkinson's disease. Add a note on difficulties to develop stem cell based novel therapies for many serious disease and injuries. [18]

OR

Q10) Describe the following: [18]

- a) Stem cells for gene therapy.
- b) What are the potential risks associated with the use of ESCs in regenerative medicines.

Q11) Explain with the help of flow chart the tissue engineering process in detail.
Add a note on its importance as regenerative medicine. **[16]**

OR

Q12) Write short notes on the following: **[16]**

- a) Induced pluripotent stem cells.
- b) Stem cells growth and differentiation factors.
- c) Therapeutic cloning.
- d) Cell regeneration and cell replacement.

EEE