

[47/A4]

SEAT No. \_\_\_\_\_

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SARDAR PATEL UNIVERSITY

M. Sc. (Integrated) Biotechnology – Tenth Semester Examination

Wednesday, 20<sup>th</sup> March, 2019

10:00a.m. to 1:00p.m.

PS10CIGMB2: REGENERATIVE MEDICINE

Note : (i) Figures to right indicate marks.

(ii) All questions are compulsory.

Total Marks: 70

Q-1 Choose the most appropriate alternative for the following:

(08)

1. What is an argument in favor of using embryonic stem cells over adult stem cells?
  - a) Embryonic stem cells are never really living.
  - b) Embryonic stem cells can differentiate into many more types of cells.
  - c) Adult stem cells reproduce much faster than embryonic stem cells.
  - d) Adult stem cells cannot be cultured.
2. Which of the following is used as a marker of Hematopoietic stem cells?
  - a) CD34
  - b) CD44
  - c) CD90
  - d) CD105
3. Which stem cells are known as immuno-privilege cells?
  - a) Hematopoietic stem cells
  - b) Mesenchymal stem cells
  - c) Very Small Embryonic Like stem cells
  - d) Embryonic stem cells
4. Nanog is very important gene for the maintenance of pluripotency because it...
  - a) maintain self-renewal
  - b) inhibit the differentiation
  - c) is an oncogene
  - d) is a tumour suppressor gene
5. The region of the midbrain affected by Parkinson's disease is:
  - a) Supra chismatic nucleus
  - b) Para ventricular nucleus
  - c) Cerebellum
  - d) Substantia Nigra
6. One of the following is non-organ specific autoimmune disease.
  - a) type-1 diabetes
  - b) rheumatoid arthritis
  - c) lupus
  - d) multiple sclerosis
7. Cells isolated from the body of a donor of the same species are known as...
  - a) Autologous
  - b) Allogenic
  - c) Xenogenic
  - d) Syngenic
8. Which of the following scaffold preparation technique require solid porogens?
  - a) Gas foaming
  - b) Emulsification
  - c) SCPL
  - d) Electrospinning

Q – 2 Attempt ANY SEVEN from the following: (14)

1. Classify the stem cells on the base of potentiality with example.
2. What is pluripotency?
3. What are the different stem cells populations present in bone marrow?
4. Narrate about embryonic germ cells.
5. What are the sources of HSCs?
6. Enlist the characteristics of VSEL.
7. How therapeutic cloning differs from reproductive cloning?
8. What is auto immune disease? Give examples
9. What are the basic components of Tissue Engineering?.

Q – 3 (a) Explain normal differentiation and trans differentiation of different adult stem cells. (06)

(b) Explain culture method of ESCs and add a note on therapeutic applications of ESCs. (06)

OR

(b) Write Notes on followings:

(i) FACS technique for stem cell identification and separation. (03)

(ii) Similarities and Difference between Adult stem cells and Embryonic stem cells. (03)

Q – 4 (a) Discuss properties, sources, identification and characterization of mesenchymal stem cells. (06)

(b) Give detailed account on SCNT technique and its applications. (06)

OR

(b) Explain how to generate induced pluripotent stem cells from somatic cells. (06)

Q – 5 (a) Explain any one example of neurodegenerative disease and discuss stem cell based repair mechanism. (06)

(b) How myocardial infarctions develop in heart? Explain the stem cell repair mechanism for the damaged heart muscle? (06)

OR

(b) Discuss how Stem cell therapy holds immense promise for the treatment of patients with diabetes. (06)

Q – 6 (a) Explain the various techniques involved in synthesis of tissue engineering scaffolds. (06)

(b) Citing suitable examples explain the role of adult stem cells for tissue engineering. (06)

OR

(b) Write notes on following:

(i) Difference between Natural and Synthetic polymers used for scaffold preparations. (03)

(ii) Different types of Cell Sources for Tissue Engineering. (03)