



**M.Sc. II Semester Degree Examination, October - 2023**

**BIOTECHNOLOGY**

**Stem Cell Technology And Regenerative Medicine**

**(NEP)**

Time : 3 Hours

Maximum Marks : 70

**Note :** (i) Answer **any five** of the following questions with question no. **1** is **compulsory**, each question carries **equal** marks.

(ii) Draw neat diagrams wherever necessary.

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|----|-----|---|-----------|
| 1. | (a) | Explain in detail about general hierarchy of Hematopoietic stem cells.              | <b>10</b> |
|    | (b) | Write a short note on human embryonic stem cells and their application in medicine. | <b>4</b>  |
| 2. | (a) | Brief about paracrine and autocrine signaling.                                      | <b>7</b>  |
|    | (b) | Give an account on stem cell communication.   | <b>7</b>  |
| 3. | (a) | Give an account on genetically engineered stem cells.                               | <b>7</b>  |
|    | (b) | Describe in detail about erythrocytoses and polycythemia vera conditions.           | <b>7</b>  |
| 4. | (a) | Explain bone marrow transplantation process and their applications.                 | <b>10</b> |
|    | (b) | Briefly explain encapsulation technology.   | <b>4</b>  |
| 5. | (a) | Discuss current ethical guidelines for stem cell research.                          | <b>7</b>  |
|    | (b) | Explain the current regulation of human embryonic stem cell research.               | <b>7</b>  |
| 6. | (a) | Differentiate between the endocrine and extracellular matrix regulated signaling.   | <b>10</b> |
|    | (b) | Write a short note on Erythropoietin and its applications.                          | <b>4</b>  |
| 7. | (a) | Explain the stem cell based therapies for cardiac diseases.                         | <b>10</b> |
|    | (b) | Briefly explain white blood cell disorders.   | <b>4</b>  |
| 8. | (a) | Write a note on Paracrine signaling   | <b>5</b>  |
|    | (b) | IPRs  | <b>5</b>  |
|    | (c) | Hypothyroidism  | <b>4</b>  |

