0502E1455

Candidate's Seat No :_____

MSc Sem.-1 Examination
404
Life Science
February-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Instructions: All questions in Sections I & II carry equal marks

Illustrate your answers with neat diagrams wherever necessary.

Question 1 **Write the following**

(i) Draw a diagram of the spermatogenesis and give an account of the ovulation and luteal phases of the ovarian cycle. (7 Marks)

(ii) Explain various types of morphogenetic movement with its diagram. (7 Marks)

OR

(i) Write an account of the ovarian follicular phase. (7 Marks)

(ii) Define the cleavage, write its characteristic features, and give information about the cleavage pattern. (7 Marks)

Question 2 **Write the following**

(i) What are induced pluripotent stem cells (iPSCs), and how are they generated? Describe the potential applications and limitations of iPSCs in regenerative medicine. (7 Marks)

(ii) What methods can be used to preserve stem cells? List one advantage and limitation of each method. (7 Marks)

OR

(i) Explain the concepts of totipotency, pluripotency, multipotency, and unipotency. Provide examples for each. (7 Marks)

(ii) Describe the role of the hematopoietic stem cell in maintaining blood cell homeostasis. (7 Marks)

Question 3 **Write the following**

(i) Differentiate the local versus systemic toxicity and reversible versus irreversible toxicity effects of xenobiotics. (7 Marks)

(ii) Describe in detail about the evaluation parameters requirements for Acute and repeat dose toxicity study. (7 Marks)

OR

(i) List out the different methods of chemical/drug interaction and describe in brief about the Antagonism? (7 Marks)

(ii) Define Toxicology and list out the different disciplines of toxicology? (7 Marks)

Question 4 **Write the following**

(i) Distinguish serum and serum-free media. (7 Marks)

(ii) Describe metabolic assay of cell culture in detail along with its limitations. (7 Marks)

OR

(i) Describe the types of animal culture with appropriate example(s). (7 Marks)

(ii) Define Passage. Explain the methods of passaging the adherent and suspension culture. (7 Marks)

Question 5 **Attempt any seven out of twelve** (14 Marks)

(i) Differentiate between primary and continuous culture / cell lines.

(ii) What is the role of trypsin while passaging cell line.

(iii) "Anchorage dependent cells require substrate to attach with" True / False – Justify.

(iv) Name major types of stem cells

(v) What is the purpose of using fluorescent markers in stem cell research?

(vi) Define Explant. How this can be characterized?

(vii) Draw a labelled diagram of the ovarian cycle.

(viii) Differentiate between Androsperm and Gynosperm.

(ix) Draw a labelled diagram of hormonal control of spermatogenesis.

(x) Give information about different types of differentiation based on the origin of differences like shape, structure, chemical nature, and behaviour.

(xi) What is skin sensitization?

(xii) Enlist the tests require for Genotoxicity testing of any compounds?