

**Gandhi Institute of Engineering and Technology University, Odisha, Gunupur  
(GIET University)**



M.Tech. (First Semester – Regular/ Supplementary) Examinations, January– 2025  
**24MPEBT11011 – Fundamentals of Stem Cell Technology**

Time: 3 hrs

Maximum: 60 Marks

**Answer ALL questions  
(The figures in the right hand margin indicate marks)**

**PART – A****(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

	CO #	Blooms Level
a. What is Apoptosis?	CO1	K1
b. Write a short note on the Blastocyst stage.	CO2	K2
c. What is the Transformation of stem cells and its significance?	CO3	K1
d. Define hematopoietic stem cells.	CO4	K2
e. Mention the induced pluripotent cells.	CO5	K2

**PART – B****(10 x 5 = 50 Marks)**Answer ALL the questions

	Marks	CO #	Blooms Level
2. a. Explain the process of organogenesis in humans.	5	CO1	K1
b. Define the Inner Cell Mass (ICM). Describe its formation and explain its role in early embryonic development.	5	CO1	K1
(OR)			
c. What is Embryo? Discuss about the various stages of the Embryo.	5	CO1	K2
d. Discuss the cellular and molecular mechanisms involved and the significance of organogenesis in normal development.	5	CO1	K3
3.a. Explain the detailed procedure of in vitro fertilization (IVF). Discuss its clinical applications and significance in the management of infertility.	5	CO2	K1
b. What is the concept of twins? Discuss about different types of twins.	5	CO2	K1
(OR)			
c. Differentiate between asexual and sexual reproduction. And state the significance of sexual reproduction?	5	CO2	K2
d. Describe oogenesis and spermatogenesis in detail. Compare the two processes and discuss their biological significance.	5	CO2	K2
4.a. Discuss about preservation and clinical use of blood.	5	CO3	K2
b. Classify stem cells based on their origin and potency.	5	CO3	K1
(OR)			
c. Describe the different types of bone marrow transplantation and their clinical applications.	5	CO3	K3
d. Elaborate about Apheresis and its types.	5	CO3	K2
5.a. How have stem cells been used for AIDS patients?	5	CO4	K1
b. Discuss about any three diseases, where stem cell therapies have shown potential in curing them.	5	CO4	K1
(OR)			
c. Describe the pathological changes that occur in the brain due to Alzheimer's	5	CO5	K2

disease.

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|------|--|---|-----|----|
| d.   | What are the common treatment strategies for managing Parkinson's disease?                         | 5 | CO5 | K2 |
| 6.a. | Explain the biological mechanisms behind the ageing process and how anti-ageing strategies work.   | 5 | CO5 | K2 |
| b.   | What are epidermal stem cells? Explain their role and significance in skin maintenance and repair. | 5 | CO6 | K1 |

(OR)

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|----|---|---|-----|----|
| c. | List the common symptoms and early signs of Multiple Sclerosis. | 5 | CO6 | K1 |
| d. | What properties of stem cells make them useful in cell therapy? | 5 | CO6 | K2 |

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