

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: BIOTECH**

**SEMESTER : V
SESSION : MO/2025**

SUBJECT: BE317 STEM CELL AND TISSUE ENGINEERING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Define stem cells and enlist their salient characteristics? Classify stem cells based on origin and briefly explain each category with examples?	[5] CO1	BL1,2
Q.1(b)	Define iPSCs? Explain cancer stem cells and give their salient characteristics.	[5] CO1	BL1,2
Q.2(a)	Define Stem cell culture media? Describe the components of stem cell culture media with their role?	[5] CO1,2	BL1,2
Q.2(b)	Define Feeder layer? Differentiate between adherent monolayer vs suspension culture of stem cell?	[5] CO1,2	BL1,4
Q.3(a)	“Stem cell technology a boon for medical field”. Justify your answer by giving details and supporting examples of specific disease/medical condition?	[5] CO1,2	BL5
Q.3(b)	Explain the terms Biomaterials, Tissue engineering and Regenerative medicines with suitable examples?	[5] CO1,2	BL2
Q.4(a)	Classify Biomaterials on different basis and discuss the type “Proteins as biomaterials” with suitable examples.	[5] CO1,2	BL1,2
Q.4(b)	Enlist the major techniques for fabricating scaffold? Explain any one in detail with suitable examples?	[5] CO1,2	BL1,2
Q.5(a)	Describe the major components required for setting up a tissue culture laboratory?	[5] CO3	BL2
Q.5(b)	Explain the key hazards associated with stem cell storage & transplantation?	[5] CO3	BL2

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