

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

**CLASS:** B.Tech  
**BRANCH:** Biotechnology

**SEMESTER : V**  
**SESSION : MO/2023**

**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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			<b>CO</b>	<b>BL</b>
Q.1(a)	Define stem cells and enlist their salient characteristics? Classify stem cells based on potency and briefly explain each category with examples?	[5]	CO1	BL1,2
Q.1(b)	Define iPSCs? Explain cancer stem cell 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 Feeder dependent Vs Feeder free stem cell culturing?	[5]	CO1,2	BL1,4
Q.3(a)	“Stem cell technology a boon for medical field”. Justify your answer with giving detailed supporting examples of specific disease/medical condition?	[5]	CO1,2	BL5
Q.3(b)	Explain the concept of Scaffold based tissue engineering and describe the major characteristics of ideal scaffold materials?	[5]	CO1,2	BL2
Q.4(a)	Define Tissue Engineering and Biomaterials? Classify Biomaterials and discuss the type “Polysaccharides 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 & transport?	[5]	CO3	BL2

**.....28/11/2023 M:.....**