

Invigilator's Signature :

CS/B.Tech (BME)/SEM-8/BME-803D/2010 2010

TISSUE ENGINEERING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

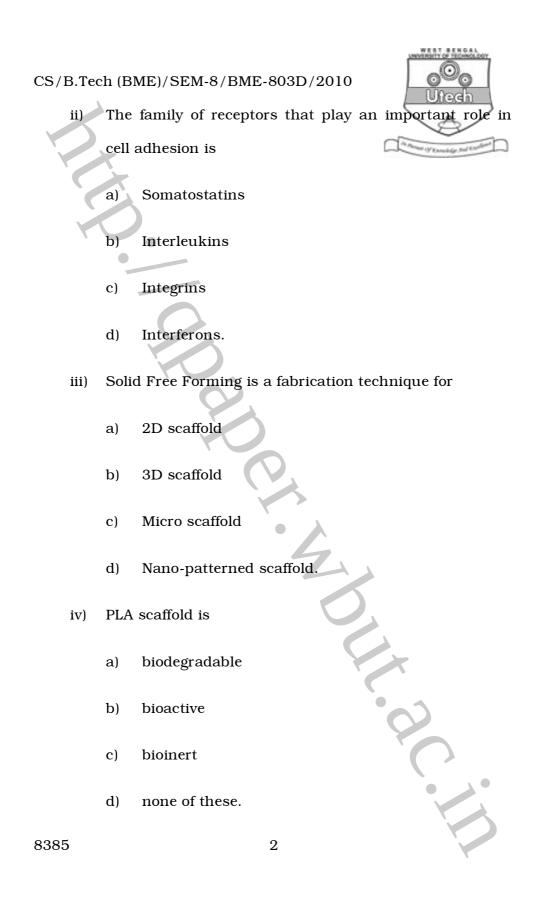
1. Choose the correct alternatives for the following :

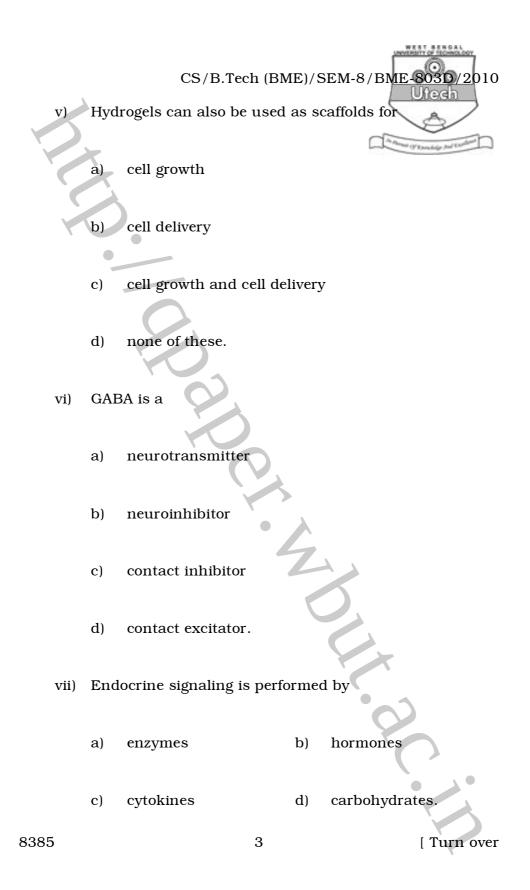
 $10 \times 1 = 10$

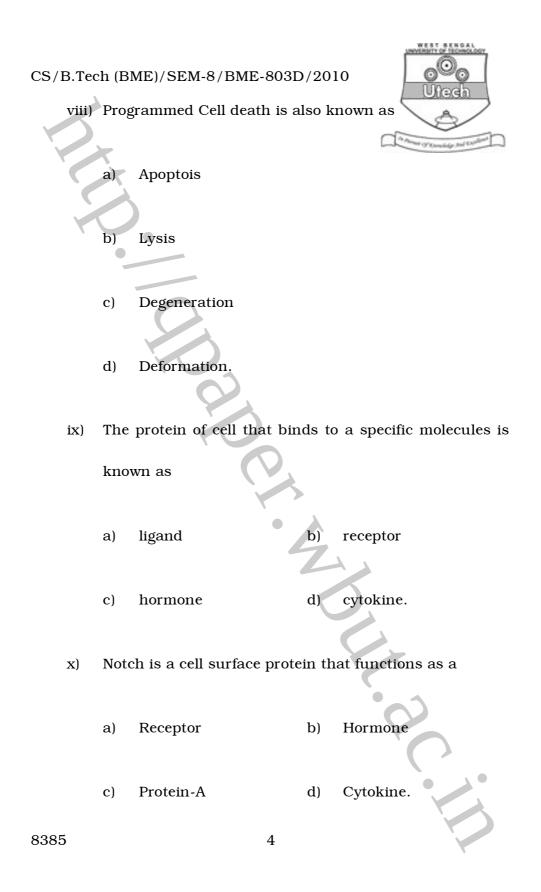
[Turn over

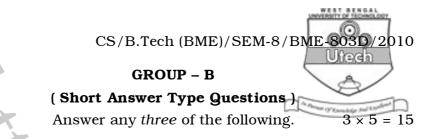
- i) In vaccine preparation Tween is used for
 - a) Cell lysis
 - b) Cell purification
 - c) Cell growth
 - d) Cell maturation.

8385









- What is tissue engineering ? Mention the basic clinical goals 2. and fundamental challenges of tissue engineering.
- 3. Define stem cells. Classify them based on their functioning.

2 + 3

What do you mean by cell signaling molecules ? Briefly 4. explain the different methods of cell-to-cell communication.

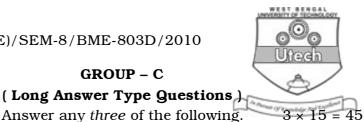
2 + 3

How is cell culture carried out under laboratory conditions ? 5. What is the significance of an autoclave in cell culture ?

2 + 3

- What are the different components of the Extracellular 6. matrix ? How do they function ? 2 + 3
- Write down the different process of vaccine formation. 7. 8385 5

[Turn over



8. Define tissue. What are the different types of tissues in the mammalian body ? Classify tissue based on their structure and function. 2 + 4 + 9

GROUP – C

- 9. What are the principal cell types involved in Inflammatory responses ? With the help of a flow-chart, explain the different processes involved in wound healing. What is target cell apoptosis ? 5 + 7 + 3
- 10. Give a brief overview of growth factor and its significance. Describe the signaling pathway for cell's response to the ligand. What is cell surface marker ? 6 + 7 + 2
- 11. What is scaffold ? Name the engineering materials used for scaffold fabrication ? Mention the important parameter for scaffold selection. Describe the different types of scaffold used in tissue engineering. Briefly explain the process of cell 4 + 2 + 5 + 4placement on scaffold.

8385

- CS/B.Tech (BME)/SEM-8/BME-803D/2010 12. Describe the different types of angiogenesis to mimic nutrient transport within the tissue compartment. Mention the chemical stimulation for angiogenesis. With the help of a diagram, explain the mechanism of adhesion between leukocytes and endothelial cells. 6 + 2 + 7
- 13. What do you understand by cell-cell interaction ? Briefly explain the different types of stem cells. Demonstrate bioreactor for achieving nutrient transport in an engineered tissue construct. 2+9+4

7

[Turn over

8385