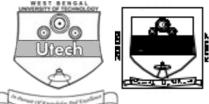
# TISSUE ENGINEERING (SEMESTER - 8)

# CS/B.Tech(BME)/SEM-8/BME-803D/09



1.	Signature of Invigilator	In Passage (y Exercising 2nd Excilored										
2.	Signature of the Officer-in-Charge											
	Roll No. of the Candidate											

CS/B.Tech(BME)/SEM-8/BME-803D/09
ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009
TISSUE ENGINEERING (SEMESTER - 8)

Time: 3 Hours [Full Marks: 70

### **INSTRUCTIONS TO THE CANDIDATES:**

- 1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
- 2. a) In **Group A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
  - b) For **Groups B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group B** are Short answer type. Questions of **Group C** are Long answer type. Write on both sides of the paper.
- 3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
- 4. Read the instructions given inside carefully before answering.
- 5. You should not forget to write the corresponding question numbers while answering.
- 6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
- 7. Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.
- 8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
- 9. Rough work, if necessary is to be done in this booklet only and cross it through.

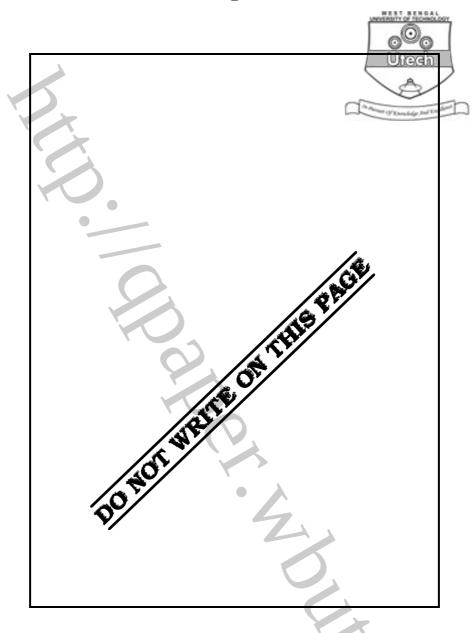
No additional sheets are to be used and no loose paper will be provided

# FOR OFFICE USE / EVALUATION ONLY Marks Obtained Group - A Group - B Group - C Question Number Marks Obtained Description Marks Obtained

Head-Examiner/Co-Ordinator/Scrutineer

8888 D/D ( 27/04 )







# **ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL - 2009** TISSUE ENGINEERING **SEMESTER - 8**

Time: 3 Hours] [Full Marks: 70

			( Mu	tiple Choice	e Type (	guestions )					
1.	Cho	Choose the correct alternatives for the following:									
	i)	The	formation of bloo	d vessel from	the pre	he pre-existing blood vessel is known as					
		a)	angiogenesis	0)	b)	vascularization					
		c)	osteogenesis	10	d)	phagocytosis.					
	ii)	The	Major Histocomp	atibility Com	plexes (	MHCs ) are					
		a)	signaling molec	ules	b)	growth factors					
		c)	cell surface mar	kers	d)	cell adhesion molecules.					
	iii)	Bone Morphogenic Protein (BMP)			is a						
		a)	cell surface mar	ker	b)	growth factors					
		c)	hormone		d)	neurotransmitter.					
	iv)	Poly	rglycolic Acid ( PG	A) scaffold is	<b>.</b>						
		a)	biotolerant		b)	bioactive					
		c)	bioinert		d)	biodegradable.					



v)	In t	rozen away and stored in								
	a)	liquid hydrogen	b)	liquid nitrogenech						
	c)	liquid helium	d)	autoclave.						
vi)	Cell	signaling compounds cytokines	are a	group of						
	a)	proteins and peptides	b)	fats and triglycerides						
	c)	carbohydrates	d)	hormones and steroids.						
vii)	c-Al	MP and c-GMP functions as								
	a)	hormone	b)	receptor						
	c)	second messenger	d)	ligand.						
viii)	The	signals which affect only cells o	f the sa	ame cell type as the emitting ce	ell are					
	a)	endocrine	b)	autocrine						
	c)	paracrine	d)	none of these.						
ix)	Car	bon nanotubes are used for tiss	ue engi	ineering scaffolds as they are						
	0)	hiocompatible	b)	biodegradable						
	a)	biocompatible	D)	blodegi adable						
	c)	biopolymers	d)	none of these.						
x)	PLA	PLA degrades within the body to form								
	a)	amino acid	b)	glycolic acid						
	c)	lactic acid	d)	phosphoric acid.						



# GROUP – B

## (Short Answer Type Questions)

Answer any three of the following.



 $3 \propto 5 = 15$ 

- 2. What are CAMs? What are the different types of CAMs associated with cell signalling? How do CAMs help to transmit signals? 2+2+1
- 3. What are the basic criteria of a scaffold used for tissue reconstruction? Give two common examples of scaffolds constructed from natural materials. State three major components of ECM. 2+2+1
- 4. What is tissue engineering? Mention the basic clinical goals and fundamental challenges of tissue engineering. 2+3
- 5. What is vasualization? Describe the mechanism of basic wound healing. 2 + 3
- 6. Define the term "cellular differentiation". Mention the basic properties of stem cell.

3 + 2

7. Describe different kinds of matrix materials used in tissue engineering. Mention the importance of growth factors in this field. 3 + 2

## GROUP - C

## (Long Answer Type Questions)

Answer any three of the following.

 $3 \propto 15 = 45$ 

- 8. Define the term "angiogenesis". Describe the process of angiogenesis along with chemical stimulants. Mention the current scope of development and therapeutics uses of tissue engineering. 3 + 6 + 6
- 9. Give a brief overview of receptor-ligand binding mechanism. Describe the signaling pathway for cell's response to the ligand. What is cell surface marker? 6 + 7 + 2
- 10. What is a Bioreactor? Why is cell seeding important in a Bioreactor? How do bioreactors function for engineering 3D-tissue construction? 2 + 3 + 10



- 11. What do you understand by growth factors? Cytokines are a unique family of growth factors Justify. Classify growth factors based on their principal source and primary activity. 2+3+10
- 12. a) What are the basic aspects of wound healing?
  - b) With the help of a suitable diagram, explain the different pathways for cell signalling. 5+10
- 13. Write short notes on any two of the following:

 $2 \propto 7\frac{1}{2} = 15$ 

- a) Transplant immunology
- b) Cell preservation and storage
- c) Cells for tissue engineering
- d) Engineering tissues for bones and cartilages.

**END**