Reg. No. : | | | | | | | | | | | | |

Question Paper Code: UD302

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Professional Elective

Biotechnology

21BTV302 - TISSUE ENGINEERING

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

PART A - (10 x 2 = 20 Marks)

1.	Define the term "Totipotency".	CO1- U
2.	Write down the contributions of Stem cell therapy to leukemia treatment.	CO1- U
3.	Construe the term 'angiogenesis'	CO1- U
4.	Write down the applications of EGF and FGF in tissue engineering.	CO1- U
5.	List four major steps involved in conventional processing of bioceramics.	CO1- U
6.	Angioplasty stents are having surface modification of carbon as a bone analogue material. Why?	CO2-App
7.	Primordial germ cell moves in an amoeboid fashion during differentiation. Reason out the statement.	CO2- App
8.	Cord blood cell plays a important role in leukemia treatment. Reason out this statement.	CO2-App
9.	Ageing can be addressed by stem cell therapy. Provide an expert advice.	CO2- App
10.	What are the essential features required for a stem cell for successful transplant?	CO1- U

PART – B (5 x 16= 80 Marks)

11.	(a)	Explain the basic steps in the field of tissue engineering in detail.	CO1- U	(16)
		Or		
	(b)	Explain in detail the various kinds of tissues in our Human body and their characteristics.	CO1- U	(16)

12.	(a)	Explain the various factors that affect vascularity and angiogenesis in detail.	CO1- U	(16)
		Or		
	(b)	Describe the process of 'cell migration, progenitor cell and differentiation' in detail with suitable diagrams.	CO1- U	(16)
13.	(a)	A heart patient needs urgent stenting for a block in coronary artery. But angioplasty has lot of minus because of copper made stents. Suggest the cardiologist about the need for making a 'bio compatible' material by vividly explaining its various properties.	CO2 -App	(16)
		Or		
	(b)	A person met with an accident. He suffered severe knee injury. His knee cap needed replacement. Suggest the doctor about the features of biomaterials to be used for bone replacement surgeries, its various characteristics and utilities. Using bottom up approach and fundamental principles of tissue engineering how will you produce bone?	CO2- App	(16)
14.	(a)	Explain the surface modification of carbon as a bone analogue material.	CO1- U	(16)
		Or		
	(b)	Explain the importance of glass transition temperature and melting point in evaluating biomaterials.	CO1- U	(16)
15.	(a)	Describe the stages of cryogenic preservation and storage of animal cells, its importance and applications in detail.	CO1- U	(16)
		Or		
	(b)	Explain the various cell culture bioreactors with diagrams and their applications for various diseases	CO1- U	(16)