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MANIPAL INSTITUTE OF TECHNOLOGY												
VII SEMESTER B.Tech. (BME) DEGREE MAKE UP EXAMINATIONS, DEC/JAN 2016-17 SUBJECT: TISSUE ENGINEERING (BME 431) (REVISED CREDIT SYSTEM) Friday, 30 th December 2016: 2 PM to 5 PM												
Instructions to Candidates: Answer any five full questions.												
1A.	Differentiate between matrix of cartilage and bone. Mention the function of epithelial tissue.											
1 B .	Write down the working of an autoclave.											
1C.	How do hypotonicity and hypertonicity help in sterilization? Explain the role of membrane filters in the sterilization process.										8	
2A.	Write down the development of heart during embryogenesis (highlight the role of germ layers)											
2 B .	Explain the working of a gamma ray irradiator.											
2C.	Explain the transcription and translat cell signaling.	ion invo	olved	in "g	gene	activ	vatio	n" pi	roces	s in	6	
3A.	What is the role of vasculo-endothelial growth factor in angiogenesis? Explain the working of an anti-VEGF therapy in cancer management.										3+3	
3B.	What is 'neural crest cell'? Analyz keratinocyte proliferation (be specific	the the twith the	functi e ansv	on o ver).	f dif	feren	nt co	ompo	nents	in	2+4	
3C.	Explain the following stages of cell signature factors):	gnaling	of sk	in (hi	ghlig	ght th	ne rol	le of	diffe	rent	8	
	(i) Hemostasis and inflammation (ii) p	rolifera	tion a	nd (ii	i) re	mode	eling					

4A.	Differentiate 'pluripotent' and 'multipotent' stem cells. Discuss factors regulating asymmetric stem cell division.	6
4B.	Classify and explain stem cell niche.	6
4C.	Explain the steps associated in the isolation of human embryonic stem cells.	8
5A.	How do you prepare feeder cell layer? Highlight its advantage in stem cell isolation.	6
5B.	What is "porogen"? How does it help in making porous scaffold? Explain.	2+4
5C.	Explain different gradient centrifugation techniques for cell selection.	8
6A.	Mention the role of different types of cryoprotectants (with example) in cryopreservation of cells. Why is vitrification a preferred choice over slow freezing?	4+2
6B.	Mention the criterions for scaffolds for tissue engineering. If you seed embryonic stem cells into 3D scaffold from 2D scaffold, would there be any change in stem cell properties? Justify your views.	4+2
6C.	Explain the term ''passage'' and ''cell lines''. Mention the major components of tissue culture medium with purpose.	4+4