NATIONAL INSTITUTE OF TECHNOLOGY, ROURKELA
MID - SEM EXAMINATION, 2020
SESSION: 2019-2020 (Spring)

Dept. Code: **BM,** Subject: **Tissue Engineering,** Subject code: **BM 3202**
No. of pages:**01** Full Marks: **30** Duration: **2*Hours***

All parts of a question should be answered at one place.

Sl.no	Particulars	Marks
1.	(a) What are the important controlling parameters for freeze gelation method for fabrication of scaffold? What are its advantages over freeze drying method? Which is the most widely used gas for creating pores in scaffold?	(1+2+1)
	(b) Explain the principle of electrospinning? What happens to the numbers of beads and nanofibers, if the polymer solution is more viscous? How the conductivity of polymer solution can be increased to make it more suitable for electrospinning?	(2+1+1)
	(c) What are the ultimate goal and challenges of Tissue engineering?	(2)
2.	(a) Describe a method of constructing a three-dimensional tissue graft from microfibrous polymeric matrix and cell.	(6)
	(b) Explain how mechanical property is important in tissue regeneration. What mechanical properties can be assessed from stress-strain curve of a scaffold?	(4)
3.	(a) Write a brief note on desirable properties of scaffold required for tissue regeneration.	(4)
	(b) Explain the method of assessing morphological property of a tissue scaffold.	(2)
	(c) To measure the porosity of a polymer blend porous scaffold by liquid displacement method, 0.68 gm. of scaffold was submerged into a graduated beaker containing 40ml of ethanol. The sample was kept for 5 min permitting the ethanol in the pores of the porous scaffold. The total volume of ethanol and ethanol impregnated scaffold was recorded as 45 ml. Finally, the prepared scaffold was removed from the beaker and remaining ethanol volume was recorded as 25 ml. Calculate the porosity and density of the scaffold.	(4)