

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Summer 2021– 2022 Examination**

**Semester: 8**  
**Subject Code: 203111481**  
**Subject Name: Tissue Engineering**

**Date: 30/03/2022**  
**Time: 10:30 am to 01:00 pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions - (All are compulsory, Each Question carry one mark) (15)**

1. The formation of ectoderm and mesenchyme occur at the \_\_\_\_\_ week of gestation.  
(a) 5th (b) 21st  
(c) 17th (d) 18th
2. The life span of erythrocytes is about:  
(a) 80 days (b) 90 days  
(c) 110 days (d) 120 days
3. \_\_\_\_\_ cells have a larger or better surface area to volume ratio.  
(a) Larger (b) Thicker  
(c) Smaller (d) Thinner
4. Bleeding, Inflammation, Proliferation & Remodeling are phases of  
(a) Wound healing (b) Clotting  
(c) Cell differentiation (d) Cell maturation.
5. Which of these polymers is not used in the scaffold architecture?  
(a) PMMA (b) PLA  
(c) PGA (d) PLLA
6. The heart development in embryo starts with the formation of \_\_\_\_\_.
7. Name any one tissue engineered skin graft that is in use.
8. Which bone cells are responsible for bone formation and resorption?
9. Angiogenesis is formation of the arteries and veins. True/ False?
10. What is the function of FGF?
11. Why are the tissue engineered or biological valves not preferred over prosthetic valves?
12. What do you mean by the term “Split Organ Transplant”?
13. What is a histioconductive approach in tissue engineering?
14. What is cryopreservation?
15. State the three germ layers and the cells arising from it.

**Q.2 Answer the following questions. (Attempt any three) (15)**

- (A) Describe the skeletal development during embryogenesis.
- (B) What are the steps of cell migration? Discuss in detail.
- (C) Write a note on cell adhesion molecules (CAMs).
- (D) State and explain the types of nerve injury and the approaches in tissue engineered nerve repair.

**Q.3 (A)** How does the immune system work? Briefly explain surface hydrophobicity. **(07)**

**(B)** What are the various scaffold fabrication techniques? Explain any one in brief. **(08)**

**OR**

**(B)** What is tissue engineering? Mention the basic goals and challenges in tissue engineering along with the three tools of tissue engineering. **(08)**

**Q.4 (A)** Write a short note on tissue culture, also state the advantages and disadvantages. **(07)**

**OR**

**(A)** What is a bioreactor? Why is it important in tissue engineering? State its functions. **(07)**

**Q.4 (B)** Explain human heart development during embryogenesis. **(08)**