

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech. Winter 2019-20 Examination**

**Semester: 5<sup>th</sup>**  
**Subject Code: 03111330**  
**Subject Name: Biomaterials and Implants**

**Date: 03/12/2019**  
**Time: 10:30am – 01:00pm**  
**Total Marks: 60**

**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 :****(15)**

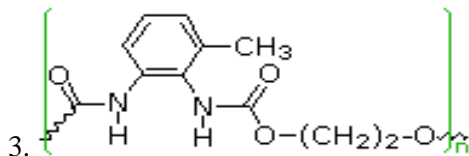
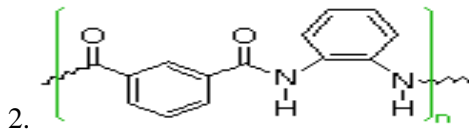
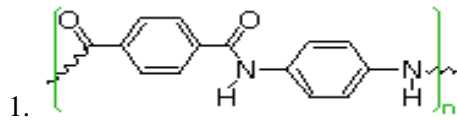
(Fill in the blanks, one word answer, MCQ-not more than Five in case of MCQ) (All are compulsory) (Each of one mark)

1. Hip replacement is also known as \_\_\_\_\_ **1**
2. Common Conditions that lead to TKR are \_\_\_\_\_ **1**
3. \_\_\_\_\_ refers to bone which is harvested from one individual and transplanted into another within same species **1**
4. \_\_\_\_\_ is known as father of implant dentistry. **1**
5. \_\_\_\_\_ are used after cataract extraction to replace the opaque crystalline lens of the eye. **1**
6. **Cyanoacrylate tissue glues have been used in the management of:** **1**
  - a. Corneal perforations
  - b. Hernia repairs.
  - c. Anal fistulae
  - d. Nerve anastomoses
7. **Which of the following metal alloy have a shape memory effect:** **1**
  - a. Platinum
  - b. Nitinol
  - c. Tantalum
  - d. Titanium
8. **Biocompatible material means :** **1**
  - a. No immunogenic response
  - b. Degrade or dissolve in the body
  - c. Material with greater mechanical stability
  - d. None of above
9. **Which polymer is used to fix prosthesis in place and also be used as void fillers:** **1**
  - a. UHMWPE
  - b. PMMA
  - c. PGA
  - d. PLA
10. What is Vascular Graft? **1**
11. What is Polymerization? **1**

12. What do you understand by the term Corrosion? 1
13. What is Bioceramics? 1
14. Define the term Fatigue. 1
15. What is the Units of Stress? 1

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

- A) What properties are desirable in polymers for contact lenses? 5
- B) Explain Biocompatibility of metals with diagram and what are the common problems related to steel biomaterials? Why titanium is preferred for dental practices? 3+2
- C) Write a note on sterilization. Explain its type in detail. 5
- D) Identify the Polymers given below and comment on condensation polymerization. 3+2



- Q.3** A) Enlist the types of contact lenses. Explain any one in detail with example. (07)
- 2+5**
- B) What are the common implant materials used in orthopedics explain along with examples. Also, discuss the advantages and disadvantages. (08)
- 5+3**

**OR**

- B) Enlist the various types of artificial Heart valve. Explain the mechanical heart valve with the help of diagram along with advantages and disadvantages. (08)
- 2+6**

- Q.4** A) Discuss Tensile-Compression Properties and shear properties along with their expression. What is Elastic and Plastic Deformation? (07)
- 3+5**

**OR**

- A) Classify dental implants and explain in detail about dental implant based on the surface of implant and type of the material. (07)
- 2+5**
- B) Write a note on Total Hip replacement along with complications associated. (08)
- 5+3**