

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- Vth SEMESTER-EXAMINATION – MAY/JUNE - 2012****Subject code: 150301****Date: 05/06/2012****Subject Name: Biomaterials and Implants****Time: 02:30 pm – 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Enlist material selection criteria for biomaterial & explain it in detail. **07**
(b) What is polymerization? Write down characteristics of hydrogel. **07**

- Q.2** (a) Enlist characteristics of stainless steel & give advantages & disadvantages. **07**
(b) Give the name of biomaterial used in dental implants and explain any two of them in detail. **07**

OR

- (b) Describe considerations for the design of heart valve. **07**

- Q.3** (a) Explain surface properties of biomaterials & their testing. **07**
(b) Define following terms: **07**
1) Biocompatibility 2) Biomaterial 3) Implant
4) Prosthesis 5) Orthosis 6) Corrosion 7) Shape memory effect.

OR

- Q.3** (a) Write a short note on cobalt alloys. **07**
(b) Give properties of ceramics with its merits and demerits. **07**

- Q.4** (a) What are composites? Explain fibrous & particulate composites in orthopedic implants. **07**
(b) 1) Describe the anatomy of hip joint. **04**
2) Explain the reasons for failure of hip joints. **03**

OR

- Q.4** (a) Write short notes on IABP and stents. **07**
(b) Write a short note on calcium phosphate. **07**

- Q.5** (a) Explain what biodegradable material is & give their application. **07**
(b) Draw the block diagram of synchronous & asynchronous pacemaker & also explain components used in pacemaker. **07**

OR

- Q.5** (a) State the tissue response with the biomaterials. **07**
(b) Short note on nitinol with its various characteristics & application. **07**
