

**GANPAT UNIVERSITY****B. Tech. Semester: IV (Biomedical & Instrumentation) Engineering****Regular Examination April – June 2016****2BM405 Biomaterials & Implants****TIME: 3 HRS****TOTAL MARKS: 60**

- Instructions:** (1) This Question paper has two sections. Attempt each section in separate answer book.  
 (2) Figures on right indicate marks.  
 (3) Be precise and to the point in answering the descriptive questions.

**SECTION: I**

**Q.1** (10)

- (a) Explain carbon as bio ceramic. 5
- (b) Differentiate between inert ceramic and bioactive ceramic. Explain bioactive glass with their compositional dependence on bone and soft tissue bonding. 5

**OR**

**Q.1** (10)

- (a) Define: flexural strength, compressive strength, friction, stoichiometry, and hydrolysis. 5
- (b) Explain the following polymer with their specific properties and Biomedical use. 5  
 I. Polyethylene II. Polypropylene III. Silicon rubber.

**Q.2** (10)

- (a) Explain nearly inert crystalline ceramic Alumina. 5
- (b) What is polymerization? Explain chain growth polymerization with example. 5

**OR**

**Q.2** (10)

- (a) Describe the hydroxyapatite properties and biomedical applications. 5
- (b) What is the function of the contact lenses? Explain soft and hard contact lenses. 5

**Q.3** (10)

- (a) Enlist the eye implant. Explain intraocular lenses and vitreous implant. 5
- (b) Explain biodegradable polymer with their biomedical application. 5

SECTION: II

- Q.4 (10)
- (a) Enlist and explain the types of dental implant with neat diagram. 5
- (b) Enlist different methods for biocompatibility testing methods. Explain any four methods. 5

OR

- Q.4 (10)
- (a) What is the need for the sterilization? Describe the process and applications of ethylene oxide (EO) gas sterilization. 5
- (b) Define: sterility. Explain moist heat sterilization with process and application. 5

- Q.5 (10)
- (a) Which metals are used as a dental material? 1
- (b) Describe the following terms for material evaluation: 4
- i) Standard specification ii) Laboratory evaluation iii) Clinical trials
- (c) What are the advantages and disadvantages of different biomaterials? 5

OR

- Q.5 (10)
- (a) Write short note of following metals: 6
- i) Stainless steel
- ii) Co Cr Alloys
- (b) Draw & Explain the schematic of interdependent engineering factors affecting the success of joint replacement. 4

- Q.6 (10)
- (a) Differentiate traditional engineering material and biological soft tissue material. 4
- (b) Explain the different chemical and thermal properties of biomaterials. 6

-----END OF PAPER-----