

B.TECH SEM – VI (2007 COURSE) (BIOMEDICAL ENGG.) :

WINTER - 2017

SUBJECT: BIOMATERIALS

Day: **Friday**
Date: **24/11/2017**

W-2017-2537

Time: **10.00 AM TO 01.00 PM**
Max. Marks: 80

N.B.:

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of the remaining attempt any **TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.

SECTION-I

- Q.1**
- a) What are the electrical and optical properties of biomaterials? (05)
 - b) List the biomaterials used to manufacture orthopedic devices with their applications. (05)
 - c) Draw and explain schematic representation of poorly crystalline carbons. (04)
- Q.2**
- a) List the advantages and disadvantages and common applications of polymers, metals and ceramics. (07)
 - b) Explain acoustic ultrasonic and diffusion properties of biomaterials. (06)
- Q.3**
- a) What are the Cobalt based alloys? Write the compositions of Cobalt –chromium alloys used in dentistry and surgery and in which from it is generally used. (07)
 - b) Explain the following metals: (06)
 - i) Molybdenum
 - ii) Nickel
 - iii) Manganese
- Q.4**
- a) What are the resorbable ceramics and its types? What are common methods for biomaterial surface characterization? (07)
 - b) Categorize the ceramics as completely resorbable, surface reactive and nearly inert biomaterial and explain. (06)

SECTION-II

- Q.5**
- a) Write any five polymer types with its specific property and biomedical use. (05)
 - b) Explain the following terms with example: (05)
 - i) Blood compatibility
 - ii) Carcinogenicity
 - c) Classify implants used in soft tissue depending on their function. (04)
- Q.6**
- a) What is the use of silicone rubber in medical application? What are its outstanding characteristics? (07)
 - b) Explain polyamides with physical properties. (06)
- Q.7**
- a) Give brief summary of the tissue response to implants with the help of diagrammatic representation. (07)
 - b) Explain the normal wound healing process. (06)
- Q.8**
- a) Explain the importance of cardiac valve replacement and materials used for it. (07)
 - b) Explain the terms related to implants: (06)
 - i) Wires
 - ii) Pins
 - iii) Screws
 - iv) Fracture plates