

**B.TECH. SEM -V BIO MEDICAL 2014 COURSE (CBCS) : WINTER -  
2017**

**SUBJECT: BIOMATERIALS**

Day: **Saturday**  
Date: **20/01/2018**

Time: **02.30 PM TO 05.30 PM**  
Max. Marks: **60**

**W-2017-2171**

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat labelled diagrams **WHEREVER** necessary.

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**Q.1** Enlist mechanical and electrical properties of biomaterials. Give the importance of each in order to use it as an implant material. **(10)**

**OR**

**Q.1** Discuss different types of mechanical failures occurred by fracture. **(10)**

- Q.2** a) Discuss applications of Zirconia. **(05)**  
b) Explain the properties of glass ceramics. **(05)**

**OR**

**Q.2** Write a note on "Calcium Phosphate" as a ceramic biomaterial. Also give its advantages and disadvantages. **(10)**

**Q.3** Explain the steps involved in manufacturing implants with a cobalt-based alloys. Write applications of it. **(10)**

**OR**

- Q.3** a) What are the types, properties and composition of stainless steel? **(05)**  
b) Explain the process of corrosion in metallic implant. **(05)**

**Q.4** Write the properties and applications of:  
i) Silicon rubber                      ii) Polyacrylate **(10)**

**OR**

- Q.4** a) Define polymer. Explain the methods of polymeric synthesis. **(05)**  
b) Explain polyurethanes and polyamides. **(05)**

**Q.5** Write a note on  
i) Carcinogenicity                      ii) Tissue replacement **(10)**

**OR**

- Q.5** a) Explain different factors affecting blood compatibility. **(05)**  
b) Explain normal wound healing process. **(05)**

**Q.6** Explain various intramedullary devices used in fractured femoral head. **(05)**

**OR**

**Q.6** Explain different types of heart valves with schematic diagrams. What are the different materials used for manufacturing it. **(10)**

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