

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

**WINTER - 2017**

**SUBJECT : BIOMECHANICS – I**

**02.30 PM TO 05.30 PM**

Day : **Monday**  
Date : **20/11/2017**

Time :  
Max. Marks : 80

**W-2017-2434**

**N.B.:**

- 1) **Q. No.1 and Q. No.5 are COMPULSORY.** Out of the remaining questions attempt **ANY TWO** questions from each section.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 4) Assume suitable data if necessary.

**SECTION – I**

- Q.1**
- a) What are the general principles of biomechanics? [05]
  - b) What is joint replacement and explain the important considerations during joint replacement? [05]
  - c) What are the positions of anatomical axis and its corresponding movements with body parts? [04]
- Q.2**
- a) Describe bone biomechanics in detail. [07]
  - b) How analysis of biological subsystems is done from biomechanical point of view? [06]
- Q.3**
- a) Explain the movement of joint forces results in the normal and disabled human body. [07]
  - b) Describe the phases of gait during normal and fast gait. [06]
- Q.4**
- a) What are the general principles of orthosis related to following terms: [07]
    - i) Gravity
    - ii) Adjustability
    - iii) Fixed deformity
    - iv) Comfort
    - v) Utility
    - vi) Cosmesis
    - vii) Use of forces
  - b) What are the aspects regarding diagnosis and prognosis related to prosthesis? [06]

**SECTION – II**

- Q.5**
- a) Give the functional classification of orthosis. [05]
  - b) List the types of metals used to design orthotic devices with their properties. [05]
  - c) Write a note on “Artificial Lungs”. [04]
- Q.6**
- a) What are the basic components of prosthesis? [06]
  - b) Give the contraindications in relation with orthosis and biomechanics. [07]
- Q.7**
- a) What are the important considerations while selecting material for prosthesis? [07]
  - b) Categorize the leathers used in orthotic devices with application. [06]
- Q.8**
- a) What is artificial Kidney? Draw and explain artificial kidney with suitable diagram. [07]
  - b) Comment on “Intra – Aortic Balloon Pump”. [06]

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