

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012**

**Subject code: 170301****Date: 26/12/2012****Subject Name: Biomechanics****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

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

**Q.1 (a)** What is Biomechanics? Explain three classes of levers with two anatomical examples of each. **07**

**(b)** Explain biomechanics of bone and discuss the factors affecting in load carrying characteristics of bone. **07**

**Q.2 (a)** Differentiate eccentric and concentric contraction of muscles. **07**

**(b)** Discuss the factors affecting muscle force development. **07**

**OR**

**(b)** Explain Hill's model for muscle contraction and list its limitations. **07**

**Q.3 (a)** What is GAIT analysis? Explain different phase of GAIT cycle. **07**

**(b)** Explain the movement of lower body joints in locomotion with help of FAP curves during walking. **07**

**OR**

**Q.3 (a)** Explain the mechanical properties of composite matrix materials. **07**

**(b)** Discuss the fatigue failure of prosthesis. **07**

**Q.4 (a)** Explain the mathematical model of bioheat transfer. Discuss Chen and Holmes model. **07**

**(b)** Explain the transport phenomenon for artificial kidney. **07**

**OR**

**Q.4 (a)** Explain the fluid mechanics of cochlea. **07**

**Q.4 (b)** Discuss the mechanical events in cardiac cycle and its correlation with electrical events. **07**

**Q.5 (a)** Discuss the importance of blood rheology. **07**

**(b)** Explain the analysis of total peripheral flow resistance for vascular system. **07**

**OR**

**Q.5 (a)** Explain the mechanism of control of body temperature. **07**

**(b)** Explain the mechanism of control of blood pressure. **07**

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