

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016**

**Subject Code: 2160308****Date: 26/10/2016****Subject Name: Biomechanics****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

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

- Q.1** (a) Explain mechanical properties of bone. **07**  
 (b) Describe the physiology of respiratory cycle with necessary graphs. **07**
- Q.2** (a) Briefly describe the Equilibrium of coplanar forces with necessary examples. **07**  
 (b) Explain the dynamics of prosthetic valves with appropriate figures. **07**
- OR**
- (b) Explain the dynamics of Heart Valves with necessary equations. **07**
- Q.3** (a) Draw and explain the postures of human during standing, sitting and lying conditions. **07**  
 (b) Describe the material properties of Ligament and muscle. **07**
- OR**
- Q.3** (a) Describe the material properties of cartilages and tendon. **07**  
 (b) Enlist and briefly explain any two types of human joints. **07**
- Q.4** (a) Draw and explain the ground reaction force for human walking and running. **07**  
 (b) List the characteristics of different types of biomaterials required for dynamic enhancement of human locomotion with necessary examples. **07**
- OR**
- Q.4** (a) Explain below given terms in detail. **07**  
 1. Coplaner & Noncoplaner forces  
 2. Concurrent & non-concurrent forces  
 (b) Define moment of inertia. **07**
- Q.5** (a) Describe the manufacturing process of hip implant. **07**  
 (b) Explain the Behavior of active myocardium according to Hill's equation. **07**
- OR**
- Q.5** (a) List and explain the rheological properties of blood. **07**  
 (b) Write a short note on Hill's Three-Element Muscle Model. **07**

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