

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2015**

**Subject code: 170301****Date: 01/05/2015****Subject Name: Biomechanics****Time: 02.30pm-05.00pm****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) Enlist and explain various techniques being used for Analysis of Motion? **07**  
(b) Explain below given terminologies for blood vessels: **07**  
1. Homogeneity  
2. Incompressibility  
3. Inelasticity  
4. Residual Stress and Strain
- Q.2** (a) Explain muscular movements and muscular efficiency with proper equations. **07**  
(b) Draw and explain the GAIT postures during human walking. **07**  
**OR**  
(b) Describe the viscoelastic behavior of bone using Boltzmann superposition integral as a constitutive equation. **07**
- Q.3** (a) Explain the heat transfer by respiration system. **07**  
(b) What is the cause of fatigue? Explain its characteristics with necessary equations. **07**  
**OR**
- Q.3** (a) Explain the extrinsic mechanical properties of fluid. **07**  
(b) Briefly explain inertia and the contact forces acting along the mass inertia. **07**
- Q.4** (a) Explain the material properties of cartilage. **07**  
(b) Describe the material properties of Tendon and Ligament. **07**  
**OR**
- Q.4** (a) Draw and explain the GRF acting along the ankle during human running. **07**  
**Q.4** (b) Write a short note on UHMWPE. **07**
- Q.5** (a) Write a short note on force platform. **07**  
(b) Explain the method of accelerometry for GAIT analysis. **07**  
**OR**
- Q.5** (a) Draw and explain the joint moments & Power during locomotion of human. **07**  
(b) Describe the application of electrogoniometry for GAIT analysis. **07**

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