Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: 170301 **Date: 26/11/2013**

Subject Name: Biomechanics

Time: 10:30 TO 01:00 **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 below given terminologies for blood vessels: **07**

1. Homogeneity
2. Incompressibility
3. Inelasticity
4. Residual Stress and Strain

(b) Enlist and explain various techniques being used for Analysis of Motion? **07**

Q.2 **(a)** Explain muscular movements and muscular efficiency with proper equations. **07**

(b) Describe the viscoelastic behavior of bone using Boltzmann superposition integral as a constitutive equation. **07**

OR

(b) Draw and explain the GAIT postures during human walking. **07**

Q.3 **(a)** Briefly explain inertia and the contact forces acting along the mass inertia. **07**

(b) Explain the extrinsic mechanical properties of fluid. **07**

OR

Q.3 **(a)** What is the cause of fatigue? Explain its characteristics with necessary equations. **07**

(b) Explain the heat transfer by respiration system. **07**

Q.4 **(a)** Explain the material properties of cartilage. **07**

(b) Write a short note an UHMWPE. **07**

OR

Q.4 **(a)** Draw and explain the GRF acting along the ankle during human running. **07**

Q.4 **(b)** Describe the material properties of Tendon and Ligament. **07**

Q.5 **(a)** Draw and explain the joint moments & Power during locomotion of human. **07**

(b) Explain the method of accelerometry for GAIT analysis. **07**

OR

Q.5 **(a)** Write a short note on force platform. **07**

(b) Describe the application of electrogoniometry for GAIT analysis. **07**

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