GUJARAT TECHNOLOGICAL UNIVERSITY

		BE- VII ^{III} SEMESTER–EXAMINATION – MAY/JUNE- 2012	
Subj	Subject code: 170301 Date: 24/05/2012		
Subject Name: Biomechanics			
Time: 02:30 pm – 05:00 pm Total Marks: 7)
Instructions			
111501	Atte	ons. omnt all questions	
2. Make suitable assumptions wherever necessary.		ke suitable assumptions wherever necessary.	
3.	Figu	ires to the right indicate full marks.	
Q.1	(a)	Explain three mechanical characteristics of muscle.	07
		1. Force–Velocity Relationship	
		2. Force–Length Relationship	
	(1)	3. Force–Time Relationship	~-
	(b)	Compare the kinetic energy (scalar) and momentum (vector) with necessary	07
		examples.	
Q.2	(-)	Describe the stiffeness & Machanical Strength of musculaskeletal system of	07
	(a)	buman	07
	(h)	Explain Ground Reaction Forces acting along the ankle during human running	07
	(0)	with necessary graphs	07
		OR	
	(b)	Give a brief description to the uses of composite materials for prosthesis	07
	(0)		07
03	(2)	What are the different techniques used for Analysis of Motion?	07
Q.C	(\mathbf{u})	Explain the mechanical properties acting along the wall of artery during blood	07
	(0)	flow.	07
		OR	
Q.3	(a)	Briefly explain the joint moments & Power during locomotion of human.	07
	(h)	Draw & explain the pressure changes at aortic valve during heart cycle	07
	()		0.
04	(9)	What is dynamic electromyography (EMG)? Explain the use of this method for	07
Q. 4	(a)	GAIT analysis.	07
	(b)	"Bone is a viscoelastic material". Justify the statement with proper equations.	07
		OR I I I	
0.4	(a)	Define Buovancy of fluid & what is its importance in fluid mechanics?	07
C .	(h)	What is Inertia? Explain the contact forces acting along the mass inertia.	07
	(2)		07
0.5	(a)	Explain the intrinsic mechanical properties of fluid	07
0.5	(\mathbf{u})	What is the turbulence effect? Explain the applicability in aerodynamics	07
	(0)	OD	
	(a)	UN Describe the best transfer through best insulator. What materials could be used	07
Q.5	(a)	as insulators?	U/
	(b)	What is the fundamental principle of displacement of mass? Give an example of	07
		mass transfer.	07
