Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 733102 **Date: 08/12/2011**

Subject Name: Cardiovascular Mechanics

Time: 10.30 am – 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)**	Describe the diagrammatic model of major components of healthy elastic artery.	**07**
	(b)	Draw the structure of human cardiac muscle. Explain in detail ERP,RRP and SNP for myocardial cell	**07**
Q.2	**(a)**	Explain structure and function of heart.	**07**
	(b)	What is MCV? A patient has a hematocrit of 23 percent red blood cells and if that same person has 8 million red blood cells in each cubic millimeter of blood. Estimate the MCV.	**07**
		OR	
	(b)	What is MCH? A patient has a hemoglobin concentration of 13 g per 100mL of whole blood and also has three million red blood cells in each mm3of blood. Estimate the MCH.	**07**
Q.3	**(a)**	Give the differences between Stress-strain characteristics for a linearly elastic material and an artery. Justify your answer with proper reasons.	**07**
	(b)	What is LST? Describe diagrammatically the principle of LST. Also explain the schematic of LST system .	**07**
		OR	
Q.3	**(a)**	What do you mean by "compliance"? Represent its modeling by diagrammatically and mathematically.	**07**
	(b)	What is HRV? Give nay method to estimate frequency and amplitude of LF and HF components of it.	**07**
Q.4	**(a)**	Explain the modeling of pulsatile flow in rigid tubes with Fry Solution.	**07**
	(b)	Write a short note on Arrhythmia and myocardial diseases.	**07**
		OR	
Q.4	**(a)**	Explain the modeling of pulsatile flow in rigid tubes with Wormersley Solution.	**07**
	(b)	Write a short note on heart valve diseases.	**07**
Q.5	**(a)**	Describe diagrammatically and mathematically, electrical analog model of flow in a tube. Also describe equations for each node and terminal node.	**07**
	(b)	Write a shot note on hear sounds.	**07**
		OR	
Q.5	**(a)**	Describe diagrammatically and mathematically, flow through mitral valve. Also describe active ventricular relaxation and convective resistance.	**07**
	(b)	Give the relation of EKG with pressure related to heart.	**07**

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