

MANIPAL INSTITUTE OF TECHNOLOGY Manipal University, Manipal – 576 104



III SEMESTER B.Tech. (BME) DEGREE MAKE-UP EXAMINATIONS, DEC/JAN 2015-16

SUBJECT: BIOMECHANICS (BME 2104) Saturday, January 9th, 2016 : 9.00 am - 12.00 noon

TI	ME: 3	HOURS ANSWER ALL THE QUESTIONS	MAX. MAI	RKS: 100
1.	(a)	Why RBCs are highly deformable compared to other cells?		[2]
	(b)	Explain about plasma skimming.		[4]
	(c)	Explain why aorta and vene cava are called as pressure and volu respectively?	ume reservoirs	[6]
	(d)	Draw the rheological diagram showing various types of fluids and exp	blain them.	[8]
2.	(a)	What happens to the hematocrit when it has to flow through blo unequal diameters?	ood vessels of	[2]
	(b)	Define the features of viscoelasticity.		[4]
	(c)	By considering the blood composition, describe why blood is a N fluid.	Ion-Newtonian	[6]
	(d)	Write about the viscoelastic nature of sputum and cervical mucus.		[8]
3.	(a)	How much is the airway resistance in the upper and terminal airways?	,	[2]
	(b)	What are the clinical applications of Blood Rheology?		[4]
	(c)	Explain the various types of stress and strain.		[6]
	(d)	How does thrombosis and thromboembolism affect the fluid dynamic valves?	es of prosthetic	[8]

4.	(a)	Write a note on congestive heart failure.	[2]
	(b)	Explain the measuring principle of Cutometer.	[4]
	(c)	What are the three wall materials of the blood vessels? Explain them in detail.	[6]
	(d)	Draw the structure of collagen and explain it in detail.	[8]
5.	(a)	What causes diastolic murmur?	[2]
	(b)	Bone is an anisotropic material and its mechanical behavior depends upon the direction of loading. Comment on it.	[4]
	(c)	Draw the stress-strain diagram of trabecular bone and explain it in detail.	[6]
	(d)	Define the temporal parameters of a gait cycle.	[8]