

U.S.N.

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E.

Branch: Medical Electronics Engineering

Course Code: 22MD7PE3BR

Course: Biomechanics and Rehabilitation Engineering

Semester: VII

Duration: 3 hrs.

Max Marks: 100

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.			UNIT - I	CO	PO	Marks
	1	a)	Explain three simple idealized stress strain relations which are used to study the mechanical properties of a materials.	CO1	PO1	08
		b)	With relevant equations explain blood, with viscosity described by Casson's equation.	CO2	PO2	12
			OR			
	2	a)	Compare and contrast the properties of non-viscous fluid and Newtonian viscous fluid with relevant equations.	CO2	PO2	10
		b)	Explain the Response of a Viscoelastic Body to Harmonic Excitation.			10
			UNIT - II			
	3	a)	Explain the flow of properties of synovial fluid.	CO3	PO3	08
		b)	With relevant equations explain quasi linear viscoelasticity of soft tissues.	CO3	PO3	12
			OR			
	4	a)	What are the factors which affects the viscoelastic properties of a Mucus and explain the experimental charts which depicts the viscoelastic properties.	CO3	PO3	10
		b)	Discuss three Mechanical models which are often used to describe the viscoelastic behavior of materials.	CO3	PO3	10

			UNIT - III			
	5	a)	Discuss the mechanical properties and performance of skeletal muscles.	CO3	PO3	10
		b)	Explain stretch -shortening cycle of muscle function.	CO3	PO3	10
			OR			
	6	a)	Explain kinesiological view of factors affecting preferred rates of movement in cyclic activities.	CO3	PO3	10
		b)	Explain the equipment and environment factors affecting performance gait and movement analysis.	CO3	PO3	10
			UNIT - IV			
	7	a)	Define Rehabilitation and explain the classification and role of Rehabilitation team members.	CO3	PO3	10
		b)	Discuss the Levels of Preventive Health and the Economic Impact with necessary diagram.	CO3	PO3	06
		c)	Differentiate between Primary and secondary disabilities.	CO3	PO3	04
			OR			
	8	a)	Define Health. With the Health and time chart discuss the Phase in which Rehabilitation is required.	CO3	PO3	10
		b)	Define Impairment, Disability and Handicap. Analyze the relationship between these in accordance with ICIDH 1980.	CO3	PO3	10
			UNIT - V			
	9	a)	Differentiate between kinetics and kinematics with example. Discuss different phases of gait cycle.	CO3	PO3	10
		b)	What are the indications for Endurance Exercises? Discuss briefly the endurance exercises.	CO3	PO3	10
			OR			
	10	a)	Define Aphasia and Explain in brief the different types of Aphasia.	CO3	PO3	10
		b)	Explain the types of visual aids and Hearing aids with respect to the principles.	CO3	PO3	10
