

Enrollment No: _____

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech Mid Semester Exam

Semester: 6th
Subject Code: 203111351
Subject Name: Diagnostic Techniques & Instrumentation

Date: 30/01/2024
Time: (1hr: 30min)
Total Marks: 40

Sr. No.		Marks
Q.1	(A) Answer the following Questions (Compulsory): <ol style="list-style-type: none">1. What is the Need of Blood Flowmeter?2. In Flow head designing, which material is use to cover entire cable? Give appropriate reason behind it.3. Draw table for the Phase or stage of Labor along with Frequency and Duration of contractions.4. What major problem encountered in sine wave flow meter?5. In a transit –time ultrasonic blood flow meter, the angle of inclination of ultrasonic beam with the flow axis is 45°. The distance between transmitter and receiver is 2 cm. For the sound wave of 1570 m/sec, the transit time difference of the downstream and upstream ultrasonic pulses is observed 1.3×10^{-9} second. Calculate the Blood velocity. (B) Draw and Explain Block diagram of a square wave electromagnetic flowmeter in detail.	05
Q.2	Attempt any four (Short Questions): <ol style="list-style-type: none">(1) Write down principle of Ultrasonic blood flow meter and explain transit time ultrasonic blood flow meter in detail.(2) Draw and Explain Block diagram of the abdominal fetal ECG processing circuit along with averaging concept.(3) Explain Block diagram of a pulsed Doppler flowmeter along with neat diagram & Phase results.(4) Give the difference between Average vs. Instantaneous Heart rate meter in detail.(5) Draw and Explain Block diagram of labor activity monitor in detail.	12
Q.3	Attempt any two questions: <ol style="list-style-type: none">(1) Explain Block-diagram of Ultrasonic Doppler-shift based FHR measuring circuit with RR & FHR waveform result.(2) Explain indirect method over direct method for the measurement of Fetal Parameters in detail.(3) What is Pulse rate? Mention the measurement techniques of Pulse rate. Explain Strain gauge based method in detail with correlation result of HR vs. PR.	08
Q.4	(A) Draw and Explain Block diagram of a laser Doppler system for blood flow measurement in detail.	05
	(B) How Larmor frequency is used to measure arterial blood flow? Explain it with detailed diagram.	05
	OR	
	(B) How transmittance method differs from reflectance method for the measurement of Pulse rate? Which method is more suitable? Give valid reason on it. Explain Optical methods in detail with neat diagram.	05