Vivekanand Education Society's Institute of Technology

An Autonomous Institute Affiliated to University of Mumbai

End Semester Examination
Summer 2024

Max marks: 60 Duration: 2 hours
Branch: Automation & Robotics Semester: IV
Name of the Course: Signal Conditioning Circuit Design
Course code: ARC404 QP Code: R23-ARC404_012023-24

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

			Marks
Q.1	(a)	Explain with a block diagram, the working of data acquisition system.	10
	(b)	Derive and explain the gain of inverting and non-inverting amplifier. Determine the value of R_f of a non-inverting amplifier with gain 15 and input resistance (R_1) of 2 kΩ.	10
Q.2	(a)	Explain the concept of loading and use of op-amp to avoid the same, with suitable example.	10
	(b)	Explain the working of V-to-F converter, with suitable diagram.	10
Q.3	(a)	Sketch the circuit diagram of an ideal differentiator. Explain the limitations of it and show how it can be modified into a practical differentiator.	10
	(b)	Explain the working of flash type ADC, with circuit diagram.	10
Q.4	(a)	Design the circuit of an Astable Multi-vibrator using IC555 for 90% duty cycle.	10
	(b)	Explain the linear application of op-amp as: i. Subtractor ii. Current-to-Voltage converter	10
Q.5	(a)	Explain the working of RC phase shift oscillator, with diagram. Also design a RC phase shift oscillator that oscillates at 5 kHz.	10
	(b)	Explain the signal conditioning circuit for optical sensors in detail.	10

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