

Model Question Paper-2 with effect from 2022-23 (CBCS Scheme)

USN

--	--	--	--	--	--	--	--	--	--

Sixth Semester B.E. Degree Examination Mechatronics Engineering

TIME: 03Hours

Max. Marks: 100

Note: 01. Answer any FIVE full questions, choosing at least ONE question from each MODULE.

Module-1			*Bloom's Taxonomy Level	Marks	CO's
Q.01	a	What is measurement system? With an example explain the working of digital thermometer.	L2	8	CO1
	b	Explain the different types of control system with a neat diagram.	L2	6	CO1
	c	Explain Automatic washing machine system with a neat diagram.	L2	6	CO1
OR					
Q.02	a	Define closed-loop system. Explain the basic elements of a closed-loop system with a neat diagram.	L2	10	CO1
	b	Define Control system. Mention the disadvantages of open loop system.	L2	4	CO1
	c	Explain Engine management system with a neat diagram.		6	CO1
Module-2					
Q.03	a	Define sensor. Explain the classification of sensors.	L2	8	CO2
	b	Explain LVDT with a neat diagram.	L2	6	CO2
	c	Define strain gauge. Explain bonded and unbonded strain gauge with a neat diagram.	L2		CO2
OR					
Q.04	a	With a neat sketch explain the working principle of Hall effect sensors. Mention its applications. Explain one of its applications.	L2	10	CO2
	b	Explain the following terms used to define the performance of transducers. i. Sensitivity ii. Range and span iii. Repeatability iv. Stability v. Dead band	L2	10	CO2
Module-3					
Q.05	a	Explain with a neat sketch the working principle of Analog-to-Digital Converter.	L2	10	CO3
	b	Define signal conditioning. Explain the five process that can occur in signal conditioning.	L2	6	CO3
	c	Find the binary equivalent word that results from a 6.424V input into a 5-bit A/D converter with a 10V reference. $V_X = V_R(b_1 2^{-1} + b_2 2^{-2} + \dots + b_n 2^{-n}) = \pm 6.434/10 = 0.6434$	L2	4	CO3

OR					
Q.06	a	With a neat sketch describe the construction and working principle of Instrumentation Amplifier.	L2	10	CO3
	b	Explain low pass filters, high pass filters, band pass filters and band stop filters with response curves.	L2	10	CO3

Module-4					
Q.07	a	Explain brushed permanent magnet DC motor.	L3	6	CO3
	b	Explain PLC programming based on ladder diagram with a neat diagram	L3	8	CO3
	c	Write a short note on PLC.	L3	6	CO3
OR					
Q.08	a	Explain brushless permanent magnet DC motor.	L3	6	CO3
	b	Define. Stepper motor. Explain different forms of stepper motor.	L3	8	CO3
	C	Explain the architecture of PLC.	L3	6	CO3
Module-5					
Q.09	a	Briefly explain the application areas of Mechatronics.	L2	10	CO4
	b	Explain the general scheme of Hardware and Software Integrated Issues in Mechatronics.	L2	10	CO4
OR					
Q.10	a	Explain the design process of Mechatronics system with a neat diagram.	L2	10	CO4
	b	Explain the case studies of Mechatronics system with a neat diagram.	L2	10	CO4

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.