Question Paper

Exam Date & Time: 18-Nov-2019 (02:00 PM - 05:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTER FOR APPLIED SCIENCES END SEMESTER THEORY EXAMINATIONS NOVEMBER 2019 III SEMESTER B.sc. (Applied Sciences) in Engg. ELEMENTS OF MECHATRONICS SYSTEMS [IMET 231]

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions. Missing data may be suitably assumed.

1)		Define the term Mechatronics. With a neat schematic diagram explain the modular approach to mechatronics and engineering design.	(20)
2)	A)	Define transducer and sensor. What is the main difference between a sensor and a transducer.	(10)
	B)	List any 5 temperature sensors. Explain the working of any one temperature sensor.	(10)
3)		Explain in detail the construction and working principle of LVDT with suitable diagrams.	(20)
4)		Explain the construction and principle of optical encoder.	(10)
	A) B)	Draw and describe the temperature-resistance characteristics of thermistor.	(10)

⁵⁾ Explain the operation of a directional control valve





Identify the directional control valve shown in the above figure.

^{B)} What is a Lissajous pattern? Describe the kinds of input waves to be given ⁽¹⁰⁾ to a CRO in order to produce a Lissajous pattern of a line. Line Use suitable graphs/ figures to support your answer.

(10)

- With the help of a schematic diagram, explain how signal conditioning helps ⁽¹⁰⁾ to control a mechatronic system. List the various signal conditioning factors taken care for data acquisition and translation with examples.
 - ^{B)} With a neat diagram, explain the construction and working of an Inductive (10) sensor.
 List down 3 applications of the same.
- With the help of suitable diagrams, explain the difference between a Single (10) acting cylinder and Double acting cylinder.
- B) Draw the pin diagram of 8085 Microprocessor. List the properties of 8085. ⁽¹⁰⁾
- ⁸⁾ Explain how a CRO is used to measure the following parameters: (i)
 ⁽¹⁰⁾ Voltage (ii) Time period
 - ^{B)} Explain the principle of working and applications of Hall Effect transducers. ⁽¹⁰⁾

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