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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E.

Branch: Mechanical Engineering

Course Code: 16ME7DCMCT

Course: Mechatronics

Semester: VII

Duration: 3 hrs.

Max Marks: 100

Date: 23.09.2023

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

UNIT - I

1 a) Define Mechatronics; Explain the life cycle factors & design environment factors of Mechatronic system. **06**
 b) Explain the different levels of evolution of Mechatronics. **06**
 c) Make use of block diagram to discuss the microprocessor based control system for Automatic Camera. **08**

UNIT - II

2 a) Discuss in brief:
 i) Hall effect sensors ii). Inductive proximity sensor **10**
 b) Explain the following terminologies with respect to transducers:
 i) Hysteresis
 ii) Repeatability
 iii) Dead band / Dead Time
 iv) Range and Span **10**

UNIT - III

3 a) Explain the working principle of silicon-controlled rectifiers with V-I characteristics. **08**
 b) Differentiate between
 i) Thyristors & Triac
 ii) Brushed D.C. Motor & Brushless D.C. Motor **12**

OR

4 a) Explain the role of Accumulator in hydraulic system. **05**
 b) Write any five valve actuation symbols used in Hydraulic circuits. **05**
 c) Explain the working principle of solenoid activated double - acting cylinder with a neat sketch **10**

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 - IV

5	a) Realize full subtractor using two half subtractors.	08
	b) Explain Edge triggered J-K Flip-Flop along with wave forms.	12

OR

6	a) Discuss the significance of signal conditioning.	08
	b) Derive an expression for the voltage gain factor for summing amplifier.	06
	c) Discuss in brief various filters used in signal conditioning	06

UNIT - V

7	a) Identify the size, addressing mode and category of the following instructions & also write full form of instructions: i) SBI ii) STA iii) RAL iv) MOV M, C	12
	b) Write an assembly language program to subtract 2A H from D8 H such that the 'Difference & Borrow' are stored in 'x and x+2 ' locations	08
