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Question Paper Code: 57703

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Seventh Semester

Mechanical Engineering

15UME703- MECHATRONICS

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The working of stepper motor is considered to be a _____system. CO1- R
(a) Open loop system (b) Closed loop system
(c) Sequential system (d) None of these
2. Inductive pressure transducers are used to measure CO1- R
(a) Temperature (b) Flow (c) Pressure (d) Level
3. Which element used to converts hydraulic power into mechanical CO2- U
power.
(a) compressor (b) Pump
(c) Actuator (d) Convertors
4. Identify the belt drive that doesn't undergo slip while transmitting CO3- U
power
(a) Timing (b) Round (c) V- Belt (d) Cross
5. Which of the following is not an element of a mechanical building CO3- R
block?
(a) Capacitor (b) Dashpot (c) Mass (d) Spring
6. The corrective measures taken by a controller when it is operated in a CO3- U
proportional mode is
(a) $K_p e$ (b) K_p / e (c) $1/K_p$ (d) e/K_p

7. PLC can be _____ in plant to change the sequence of operation CO4- R
 (a) Only programmed (b) only reprogrammed
 (c) Programmed and reprogrammed (d) able to give a set point
8. A counter that starts from a specified number and increments down to zero is known as the CO4- R
 (a) Up counter (b) Down counter
 (c) Reset counter (d) Synchronizing counter
9. In general, design process starts with _____ of the product CO5- R
 (a) Analysis (b) Solution (c) Resale value (d) Need
10. Which sensor is used in engine management system to measure burned exhaust gas CO5- R
 (a) Oxygen sensor (b) temperature sensor (c) speed sensor (d) Need

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain in detail about the elements of measurement systems used in mechatronics applications. CO1- U (8)
12. Discuss in detail about the working of a pneumatic actuation system with neat sketch. List the merits and demerits of using pneumatic actuation system. CO2- U (8)
13. Design building blocks for translational and rotational system. Also, derive the relationship between their input and output. CO3- App (8)
14. Discuss how AND, OR, NOR and NAND systems can be formed with ladder diagram CO4- U (8)
15. Design an autonomous mobile robot using mechatronics elements CO5- App (8)