Reg. No. :

Question Paper Code: 47703

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Seventh Semester

Mechanical Engineering

14UME703 - MECHATRONICS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A good example of standalone Mechatronics system is_____.

   (a) Washing machine   (b) CIM   (c) humanoid robot   (d) aircraft

2. Inductive proximity sensors can be effective only when the objects are of _____

   materials.

   (a) Ferro magnetic   (b) Diamagnetic   (c) Paramagnetic   (d) All of the above

3. The type of drive suitable for high torque application is

   (a) Pneumatic drive   (b) Electric drive   (c) hydraulic drive   (d) Vector drive

4. What is the function of electric actuator?

   (a) Converts electrical energy into mechanical energy

   (b) Converts mechanical torque into electrical energy

   (c) Converts mechanical energy into mechanical torque

   (d)   None of the above

5. The basic building blocks of the models used to represent mechanical   CO3-R
   systems are_____

   (a) spring, mass & dashpot   (b) voltage, current & resistance

   (c) resistance, capacitance & inductance   (d) force , resistance & vibration

6. _____of PLCs can be done in very little time.

   (a) Programming   (b) Installation

   (c) Commissioning   (d) All of the above

7. PLC operates with _____ voltage.

   (a) 24 DC   (b) 5 VDC   (c) 440 VAC   (d) 240 VAC

8. For an AND logic function in PLC, X1 and X2 are the input switches
   then the output produced when the switches

   (a) X1 ON and X2 OFF   (b) X1 OFF and X2 ON

   (c) Both X1 and X2 ON   (d) Either X1 or X2 ON

9. Engine management system is made up of

   (a) Sensors   (b) Actuators

   (c) Microprocessor   (d) All of the above

10. Sensors detect a_____

    (a) Mechanical condition   (b) Chemical state

    (c) Temperature conditioning   (d) All of the above

PART - B (5 x 2 = 10 Marks)

11. List any four types of sensors and mentioned their features.

12. What is servo motor?

13. What is a digital logic control?

14. List any four criteria for selection of PLC.

15. What is engine management system?

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PART - C (5 x 16 = 80 Marks)

16.(a) Explain in detail about various temperature sensors. (16)

Or

(b) With neat sketch explain various bonded type strain gauges. (16)
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17. (a) Explain the four quadrant operation of a dc drive. (16)

Or

(b) Explain the four quadrant operation of a dc drive. (16)

18. (a) Compare the control system performance for a system with proportional control
and a system with integral control (16)

Or

(b) Explain in detail about the mathematic modelling of rotational translational
mechanical system. (16)

19. (a) Explain the features of programmable controller with a description of the
instruction sets. (16)

Or

(b) Describe the basics of PLC programming with suitable illustrations. (16)

20.(a) (i) Explain in detail about various stages in designing Mechatronics systems. (10)
(ii) Compare traditional and Mechatronics system. (6)

Or

(b) Present a case study pertaining to the design of a wireless surveillance balloon. (16)

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