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Question Paper Code: 37703

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

Seventh Semester

Mechanical Engineering

01UME703 - MECHATRONICS

(Regulation 2013)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

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. Which energy is converted into mechanical energy by the hydraulic cylinders?
(a) Hydrostatic energy (b) Hydrodynamic energy
(c) Electrical energy (d) None of the above
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. Variable speed cannot be obtained with _____.
(a) DC motors controller (b) AC motor controller
(c) Soft starter controller (d) AC & DC controllers

6. _____ of PLCs can be done in very little time.
- (a) Programming (b) Installation
(c) Commissioning (d) All of the above
7. PLCs are programmed using what language?
- (a) Natural Language such as English (b) C-language
(c) Relay-ladder logic (d) None of the above
8. _____ PLC programming methods.
- (a) Structured text (b) Ladder diagrams
(c) Function block diagram (d) All of the above
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 (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain the terms used to define the performance of a measurement system. (8)
12. Explain about the primary functions of mechanical actuation systems. (8)
13. Explain in detail Gain-scheduled and self- turning adaptive control system with a suitable block diagram. (8)
14. Explain the factors considered for the selection of a PLC. (8)
15. Discuss in detail, various design factors to be considered while designing a mobile robot? (8)