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Question Paper Code: 47703

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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. 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 (5 x 2 = 10 Marks)

11. List any four types of sensors and mentioned their features.
12. List the materials used for belts
13. What is a digital logic control?
14. What is the use of timer in PLC?
15. What is engine management system?

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)

17. (a) (i) Explain in detail about various types of stepper motor. (10)

(ii) List the advantages and disadvantages of stepper motor. (6)

Or

(b) (i) With neat sketch explain the working principle of DC motor. (10)

(ii) List the applications of solenoids. (6)

18. (a) Explain in detail about various control modes used in system design. (16)

Or

(b) With neat sketch explain the building blocks of Mechanical, Fluid and Thermal System. (16)

19. (a) Explain the basic structures of PLC. Explain in detail about the programming of a PLC. What are the advantages of PLC? (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) Explain the mechatronics design pick and place Robot. (16)

