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**Reg. No. :**

**Question Paper Code: 47073**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

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. **The sensors are classified on the basis of**

 (a) Functions (b) Performance (c) Output (d) All of the above

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. What is servo motor?

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) What are counters? Explain the different types of counters. (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)