Register Number

MECHATRONICS

Time : 3 Hours] | **[Max. Marks : 100**

Note : Answer **six** full questions from Part – A and **seven** full questions from Part – B.

PART – A

1. With a neat block diagram, explain the Measurement system. **5**

2. With respect to the sensors and transducers define the terms : **5**

    (i) Error

    (ii) Resolution

    (iii) Hysteresis

3. Define : **5**

    (i) Analog signal

    (ii) Digital signal

4. Explain Dot Matrix printer with a neat sketch. **5**

5. (a) List the different elements of mechanical actuators. **2**

    (b) List six advantages of stepper motor. **3**

6. Explain Pawl and Ratchet with a neat sketch. **5**

7. (a) List the building blocks of mechanical and electrical systems. **3**

    (b) Define Adaptive Control System. **2**

[Turn over

8. Build a mathematical model for Dashpot in mechanical system.   **5**

9. Build a ladder diagram and explain Delay-off timer.   **5**

PART – B

10. With a neat block diagram explain the functions of each element of a closed loop control system.   **10**

11. (a) Draw the sketch and briefly explain the turbine flow meter.   **5**

    (b) Explain Bimetallic thermostat with a neat sketch.   **5**

12. (a) Draw the symbols and construct the truth table for NOT, XOR and XNOR logic gates.   **5**

    (b) With a symbolic circuit diagram explain D-flip-flop.   **5**

13. Explain the working of LASER printer with a neat sketch.   **10**

14. With neat sketch explain the construction and working principle of DC motor.   **10**

15. Draw the relevant sketches and explain MOSFETs.   **10**

16. Build up a mathematical model for fluid system.   **10**

17. Build up a mathematical model for an electrical system when the resistor and capacitors are connected in series.   **10**

18. (a) List the differences between microprocessor and microcontrollers.   **5**

    (b) Construct a PLC ladder diagram and briefly explain JUMPS.   **5**

19. Explain with sketches the different network topologies.   **10**

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