4102

Mechatronics Systems
(New) (1230)

P. Pages : 2

Time : Three Hours   **Max. Marks : 100**

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory and solve **any two** bits out of a, b, & c from each questions.
5. Draw neat figures wherever necessary.
6. Assume suitable data if necessary.
7. Figures to the right indicate full marks.

1. a) Explain the principle of operation of a LVDT ? What do you mean by electrical zero position ? Draw the relative voltage signals with respect to the electrical zero position.   **10**

    b) Distinguish between transducer and sensor. Discuss the transduction principle of photoconductive, photo emissive and photovoltaic transducer.   **10**

    c) i)   What is optical encoder ? Explain incremental encoder with neat sketch.   **5**

        ii) Explain Ionization transducer with neat sketch.   **5**

2. a) Draw and explain principle, constructional detail and function of each component in magnetic tape recorder.   **10**

    b) Explain the principle of operation of successive approximation based digital to analog converter with neat sketch.   **10**

    c) i)   Explain 555 timer with pinout and block diagram.   **5**

        ii) Explain cliping and clamping ckt.   **5**

3. a) What is synchronous motor ? Explain construction & working principle of synchronous motor with neat sketch also writes characteristics and applications. **10**

b) What is the valve ? Describe the principle of operation of a solenoid valve controlling the flow of air into a pneumatic actuator with neat sketch. **10**

c) Write short note on :
   i) Piezoelectric actuator. **5**

   ii) Geneva wheel. **5**

4. a) What are the types of controllers ? Explain with example PID controller. **10**

b) Explain PLC with suitable example. **10**

c) i) Explain open loop control system with example. **5**

   ii) Difference between microprocessor and microcontroller. **5**

5. a) Explain with neat sketch industrial Robot. **10**

b) Explain ergonomics factors for advance manufacturing systems. **10**

c) Design the control architecture of the drilling machine by adopting DCS philosophy and by implementing field bus technology. **10**

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