

**MECHATRONICS**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

Explain the following:

- (a) Real time operating systems.
- (b) Simulation.
- (c) Resistors.
- (d) Filters.
- (e) Pneumatic actuation systems.
- (f) Drive selection.
- (g) MOSFETs.
- (h) Solenoids.
- (i) Digital interfacing.
- (j) Timers.

**PART – B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

2 What is stand alone control system and PC based control system? Discuss their advantages in robotics.

**OR**

3 What is meant by graphical user interface and discuss its applications in robot and CNC machine?

**UNIT – II**

4 What is an A/D converter? Explain how the process of analog to digital conversion takes place.

**OR**

5 Explain the differential amplifier and how this amplifier is connected to thermocouple to give temperature output.

**UNIT – III**

6 Explain hydraulic and mechanical actuation system and state their merits and demerits.

**OR**

7 What is meant by ball screw and ball nut? Name the thread profiles used in ball screw and nut.

**UNIT – IV**

8 Explain the following:

- (a) Opto coupling.
- (b) Circuit breakers.
- (c) Bipolar transistors.

**OR**

9 What is permanent magnet DC motor? How they are classified? Explain the principle of a permanent magnet DC motor.

**UNIT – V**

10 Explain with a block diagram, the architecture of a 8-bit microprocessor in general.

**OR**

11 Explain with a block diagram, the architecture of a programmable logic controller.

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