Chap[terwise Question Bank

Mechatronics

Ch 1 Question Bank

Introduction to Mechatronics

1. **Define Mechatronics and list out advantages and disadvantages of mechatronics.**
2. **Explain Components of Mechatronics system in detail**
3. **Draw a neat block diagram of a generalized measurement system.**
4. **Define control system and different types of control systems.**
5. **Enumerate the difference between open loop and closed loop control system.**
6. **Explain Concept of Mechatronics Approch**
7. **With a block diagram explain the working of microprocessor controlled washingmachine.**

Chapter 2

Measurement Systems

1. State and explain the laws of thermocouple.
2. Explain the **Resistance** Measurement Techniques in detail

   A] Thermistor B] Thermocouple C] RTD
3. Explain the **Pressure** Measurement Techniques in detail

   A] Diaphragm B] Bellows C] Bourdon Tube D] Strain Guage
4. Explain the **Displacement & Speed** Measurement Techniques in detail

   A] Potentiometer B] LVDT C] RVDT D] Inductive E] Capacitive F] Optical
5. Explain the **Flow** Measurement Techniques in detail/

   A] Orifice Meter B] Pilot Tube C] Rotameter D] Electromagnetic Flow meter E] Turbine Flow Meter F] Vortex Type
6. Explain the **Level** Measurement Techniques in detail/

   A] Hydrostatic B] Ultrasonic
7. Explain an instrumentation amplifier.
8. Distinguish between gross error and systematic error.

Chapter 3

Mechanical Actuation Systems

1. Explain Mechanical Actuation system
2. Explain in details with types
3. a] Kinematic Chain B] Gears C] Cams D] Gear Drive E] Belt Drives
4. Draw & Explain Hydraulic systems & its components in detail.
5. Draw & Explain Hydraulic actuators in detail
   A] Gear Pump B] Vane Pump C] Piston Pump D] Radial Piston Pump
6. Draw & Explain Hydraulic Valves in detail
   A] Check valve B] Pilot operated valve C] Pressure valve D] relief valve E] Two way & Four way valve.
7. List advantages & Disadvantages of using hydraulic systems
8. Draw & Explain Pnematic systems & its components in detail
9. Draw & Explain types of Pnematic **Control** Valves in detail
10. Draw & Explain types of Pnematic **Directional** Valves in detail
11. State the difference(s) between a single acting cylinder and a double acting cylinder.
12. List advantages & Disadvantages of using pneumatic systems

Chapter 4

Programmable Logic Controllers

1. Explain Architecture of PLC. List Advantages & Disadvantages of PLC
2. Explain Basic Instructions in PLC with Examples

   A] OTU , OTL B] XIO C] XIC D] OSR
3. Explain PLC **Timer** Functions with Examples

   A] One Delay Timer B] Off Delay Timer C] Retentive Timer D] Timer Reset Coils
4. Explain PLC **Counter** Functions with Examples

   A] Up Counter B] Down Counter
5. Explain PLC Programming Languages with Examples

   A] RLL B] SFC C] FBD D] ST E] IL
6. Explain Industrial Example of sequential Control
7. Explain Robotics & Types
8. Explain Robotics control system
9. Explain Robotics Drive system

Chapter 5

Digital Logic & Microprocessor

1. Explain Flip Flop & its Types
2. Explain Basic Logic Gates with Examples & Truth Tables
3. Explain Kmap with Examples
4. Explain Half Adder & Full Adder
5. Explain internal Architecture of 8085 Microprocessor Neat sketch
6. Explain Pin Diagram of 8085 Microprocessor with **Neat sketch**
7. Explain Instruction set of 8085 Microprocessor with **Neat sketch**
8. Explain A/D converter with Applications
9. Explain D/A converter with Applications