**DFT GROUP OF INSTITUTIONS**

**ME2401 Mechatronics**

**(Semester VII)**

**Unit – I**

**Two Marks**

1. Define mechatronics and sketch the graphical representation of mechatronics.
2. Distinguish between open-loop and closed-loop control system.
3. How do you define the sensors?
4. What do you understand by the term static and dynamic characteristics of transducers?
5. Distinguish between accuracy and sensitivity of a transducer.
6. Define the terms: Repeatability and reproducibility.
7. What are the various temperature measuring sensors commonly used I industries?
8. What are the materials used for photoresistor?
9. What are tactile sensors? Mention few applications?
10. What is hysteresis?
11. How the output of strain gauge is measured?
12. What are the element of microprocessor based controllers or microcontroller?
13. What is meant by sequential control system? Give example.
14. What is transducer? How the transducer differ from sensor?
15. How do you classify the sensor?
16. What are the factors to be consider while selecting the potentiometers?
17. Mention the various applications of Hall effect sensors.
18. Why three concentric tracks are used in an optical incremental encoder?
19. What is the principle of operation of light sensors?
20. What is thermocouples?

**Sixteen Marks**

1. Identify various elements of a closed loop system in automatic water level controller and describe their functions?
2. Explain the functioning of a closed loop system with a neat sketch for controlling the speed of a shaft?
3. Explain the Static and dynamic characteristics of transducers
4. Explain open loop and closed loop control system with neat sketch.
5. What is a sequential controller? Explain how a microprocessors based controller operates a washing machine?
6. Explain the working principle of a automatic camera?
7. Explain any three sensors for measuring displacement with neat Sketch.
8. Explain any three sensors for measuring temperature with neat Sketch.
9. Explain any three sensors for measuring pressure with neat Sketch.
10. Write a short note on Performance terminology of sensor and selection of sensor.

**Unit – II**

**Two Marks**

1. List down the factors to be considered for the selection of bearings?
2. What is the principle of relay?
3. List down the functions of JFET.
4. What is MOSFET?
5. State the reason why crossed belt transmit more power than open belts?
6. Mention various components of hydraulic systems.
7. Why sequential valves are necessary in pneumatic system?
8. What is meant by cylinder sequencing?
9. State the objectives of DCVs? Classify them?
10. What are the factors to be considered for selecting solenoids?
11. Name three output characteristics of transistor configuration.
12. What are the types of field effect transistor?
13. List down the features of synchronous motor.
14. What is a stepper motor?
15. What is electrical actuator?
16. Define ‘step angle’.
17. How are inputs and output connections made in transistor configuration?
18. Draw the symbol of SCR.
19. How do chain drives differ from rope and belt drives?
20. At what conditions SPDT,DPST an DPDT switches are used?

**Sixteen Marks**

1. How will you specify a stepper motor? Explain the general characteristics of a stepper motor.
2. Explain thyristors and triacs in detail
3. Discuss about the following actuation systems:
   1. Self – excited wound field shunt configuration DC motor
   2. Self – excited wound field series configuration DC motor
   3. Stepper motor
   4. Induction motor
4. Compare the functions of series wound D.C motors and shunt wound D.C Motors
5. Explain working principle of a) Synchronous motor b) AC Servomotors
6. Explain the principle of operation of a stepper motor.
7. Explain the various mechanical actuations system in detail.
8. What are the various types of ball bearing? Mention the application of each type.
9. Explain the principle of operation of an AC motor.
10. Explain the principle of operation of a DC motor.