5th Sem./ Mechanical/Auto /Dip in Mech/Mech (Prod)/ Mech(Maint) /Mech(Ind Intg)/Mech(Switch) 2021(W)

Th-4 Mechatronics

Full Marks: 80 Time- 3 Hrs

Answer any **FIVE** Questions including **Q No.1&2**

Figures in the right-hand margin indicates marks

1 Answer **All** questions 2 x 10

a. Define the term "Mechatronics" and give two applications of Mechatronics system.

b. What is a transducer & classify them into its various types.

c. What is an actuator? List the various types of actuators.

d. What is a PLC? Mention its uses.

e. What do you mean by "Numerical Control"? Enumerate the various applications of NC machines.

f. State the functions of Robotics.

g. List the components of a Mechatronics system.

h. What is a displacement sensor and where it is used?

i. Define machine and mechanism.

j. Write down the basic components of a PLC.

2 Answer **Any Six** Questions 5x6

a. Explain in brief the advantages and disadvantages of Mechatronics.

b. What is temperature sensor and classify it? Discuss the different types of temperature sensor.

c. Explain the working of solenoid.

d. Explain briefly: (i) Mnemonics (ii)Jump Controller.

e. List the various features and applications of CAD/CAM.

f. Explain the differences between switches and relays.

g Define robotics. Explain the laws of robotics.

3 (a)Discuss the different types of sensors. [6] 10
(b)With neat diagram explain slider crank mechanism. [4]

4 (a)Explain briefly the AC motor & DC motor. 10
(b)Write the advantages and disadvantages of robots.

5 With a neat diagram, explain the architecture of PLC. 10

6 (a)Explain briefly the hardware and the software components of CAD/CAM. [6] 10
(b)What are Spindle & feed drives? [4]

7 (a) Discuss the various types of industrial robots. 10
(b)Write the difference between Stepper motor & Servomotor.

5TH SEM./MECH /AUTO/DIP.MECH /MECH[MAIN]/MECH[PROD] /MECH[SAND]/MECH[IND.INT]MECH[AUTO] 2020(W) NEW

Th-4 Mechatronics

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions: 2 x10
   a. Define Mechatronics.
   b. "The System Mechatronics" is employed with how many systems?
   c. What is thermocouple?
   d. Define kinematic link.
   e. Define sensor. State its advantages.
   f. What is meant by solenoid?
   g. State the function of an actuator.
   h. Define spur gear.
   i. Define relay.
   j. What is mnemonics?

2. Answer **Any Six** Questions: 6 x 5
   a. Explain Mechatronics system and Measurement system with appropriate block diagram with advantages and disadvantages?
   b. Explain Electromechanical transducer with its application.
   c. Briefly describe about transducer actuating mechanism and various types of transducer.
   d. Explain briefly about light sensor, temperature sensor with a neat sketch.
   e. Give a brief description about Bolt and Belt drive mechanism.
   f. Explain different types of Industrial Robot.
   g Explain functioning of CAD/CAM system.

3 Explain briefly the Architecture basic internal structure of PLC and also the selection and use of PLC. 10

4 Classify the different types of Kinematic pair. Explain working principle of slider crank mechanism with neat sketch. 10

5 Calculate the velocity ratio and the output speed of the driver pulley on a lawn mower belt and pulley, where the input speed is 300rpm and diameter of driver pulley is 150mm and diameter of driven pulley is 15mm? 10

6 Explain Electrical Actuator and the working principle of Electrical solenoid Actuator with its application. 10

7 Write short notes on: 10
   a) Switches
   b) Guideways
   c) Spindle drive
   d) Master and Jump control
   e) DC motor

5TH SEM./ AUTO/DIP MECH ENGG/ MECH(MAINT) /MECH(PROD) /MECH(SAND)/MECH(IND.INT) /MECHANICAL / 2022(W)

Th4 Mechatronics

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

a. Define Mechatronics.
b. State the various applications of Mechatronics.
c. List the various types of the mechanical actuators.
d. Write down the advantages of PLC.
e. Define and classify transducer.
f. What is meant by mnemonics?
g. State the uses of PLC.
h. State the functions of robotics.
i. Write down the advantages and disadvantages of robots.
j. State the uses of worm gear?

2. Answer **Any Six** Questions 6 x 5

a. List the components of a mechatronic system and explain their functions.
b. Define sensor and explain the working of motion sensor.
c. Explain the working of solenoid.
d. Discuss the working of master and jump controller.
e. Explain the software and hardware components of CAD/CAM.
f. Write down the difference between switches and relays.
g Discuss the laws of robotics.

3 Describe in details the architecture of PLC with a neat diagram. 10

4 Give a detailed classification of Industrial Robots. 10

5 Write short note on: 10

1) Light sensor
2) Stepper motor

6 What is meant by drives in CNC? Explain the different types of drives present in CNC machine. 10

7 What are the different types of electromechanical transducer? Discuss in details. 10