

Roll No.

Total Pages : 03

020405

May 2024

B. Tech. (RAI) (Fourth Semester)

Mechatronics System Design (PCC-RAI-405-21)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) What is meant by system in mechatronics ?
- (b) Obtain the basic function of control system.
- (c) Give example for closed loop system and open loop system.
- (d) State the dynamic characteristics of simplified measuring system.
- (e) What are the types of strain gauge ?
- (f) What is tachogenerator ?
- (g) What are the types of bimetallic sensors ?

- (h) Mention some instruments that measure angular velocity.
- (i) Name few materials used in binding of strain gauge.
- (j) State the purpose of using potentiometer in displacement sensor. 10×1.5=15

Part B

- 2. (a) Explain briefly the information system used in Mechatronics.
- (b) Write a note on Automatic controls. 15
- 3. (a) Explain sensors and actuators.
- (b) Discuss the integrated design issues in Mechatronics. 15
- 4. (a) Write a note on advanced approaches in Mechatronics.
- (b) List the types of design process. Explain Mechatronics design with flow chart. 15
- 5. (a) Explain testing of transportation bridge surface material with suitable block diagram.
- (b) Explain the transducer calibration systems for automotive application. 15

- 6. (a) With the help of control diagram, explain pick and place robot.
- (b) What is PID Controllers ? Explain with suitable examples.
- (c) Briefly describe the concept of PLC and Ladder programming. 15
- 7. (a) What are the Low pass and High pass filters ? Explain with suitable examples.
- (b) List any *five* microsensors with one application of each. 15