M.Tech. 1st Semester Mechanical Engg. Machine Design Examination, December–2017

MECHATRONICS AND PRODUCT DESIGN

Paper–M–809–A

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt any five questions.*

1. Explain the working of inverting, non-inverting and summing amplifiers. What is RTD ? State its applications. 20

2. How the use of MATLAB and SIMULINK softwares are used in designing mechatronics product ? Explain with example. 20

3. What is Mechanical Actuation system ? What are the devices used in such system ? What are the two types of feedback loop ? 20

4. (a) Tactile sensor
   (b) LVDT
   (c) Filtering
   (d) Relays
   (e) Microcontrollers. 5×4=20

5. What is a strain gauge ? Explain with neat sketches, the wire wound, foil type and capacitive strain gauge. 20

6. Explain the working of ball screws, solenoids, line actuators and controllers in CNC machines. Distinguish between position sensors and light sensors. 20

7. Explain briefly a mathematical model of a car moving on a road. What is difference between PLC and logic card ? 20

8. (a) List down the type of Proximity sensor ; optical encoders. 20

   (b) What are the key elements of Mechatronics system ? Explain with examples.