

Roll No. ....

**23054**

**M.Tech. 1st Semester (Mech.  
Engg.) (Manufacturing &  
Automation) Examination-  
December, 2016**

**MECHATRONICS AND PRODUCT DESIGN**

**Paper 833/M-605-A**

**Time : 3 hours**

**Max. Marks : 100**

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

**Note :** Attempt any **five** questions.

1. With the help of a generalized block diagram, discuss the basic approach of Mechatronics with its various components. (20)

2. Explain in detail the role of microprocessors and microcontrol in a mechatronics system design. (20)

3. What is the basic principle used in the construction of mechanical and electrical actuators? Explain the application with reference to a solenoid valve. (20)

4. Derive a differential equation for hydraulic mechanical system lifting load. (20)

5. Draw the circuit diagram of P.A. and D.A. converters and explain their principle of operation. (20)

6. Explain the following:  
(a) Hydraulic Mechanical System (10)

(b) Low Pass and High Pass filters (10)

7. Explain the various types of sensors and transducers in detail. (20)

8. How can MATLAB and SIMULINK softwares be used in designing a mechatronics product? Explain with example. (20)