

Code No: 135CK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, May/June - 2019

INTRODUCTION TO MECHATRONICS

(Common to EEE, ECE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define Simulation. [2]
- b) List the method of filtering noise. [3]
- c) Name various CNC Programming methods. [2]
- d) What are over current sensing Techniques? [3]
- e) How a stepper motor controlled? [2]
- f) Write brief out the LED blinking. [3]
- g) Why PLC are preferred over computer control? [2]
- h) What do you understand by Jump Controller? [3]
- i) State the standard of Transfer function. [2]
- j) What is the response of PID in control system? [3]

PART - B**(50 Marks)**

- 2.a) Describe applications of Mechatronics in FMS and CIM.
 - b) What is a signal conditioner used for? How does signal conditioning work? [5+5]
- OR**
- 3.a) What is Mechatronics and its scope?
 - b) What are different types of ADC? Sketch Comparator schematic. [5+5]
- 4.a) Explain with various elements, distinguish between NC and CNC Machine.
 - b) What are Bipolar transistors used for? Explain how it works. [5+5]
- OR**
- 5.a) Discuss the tool monitoring in CNC machine.
 - b) Write brief note on Solenoids. [5+5]
- 6.a) Describe working and control of DC brushless motors drives.
 - b) Elaborate microprocessor structure with diagram. [5+5]
- OR**
- 7.a) Explain DAC with block diagram.
 - b) What are the reasons for using load equalization in an electric drive? How do you calculate drive system load? [5+5]

- 8.a) Write short notes on PLC on the Data movement and data comparison.
b) Why Latch circuit is used in PLC? Explain. [5+5]

OR

- 9.a) What are the 4 main components of a PLC? Explain its operation.
b) Explain Ladder Logic programme with any one of the examples. [5+5]

- 10.a) What is proximity sensor and Explain their types?
b) Distinguish between Continuous and discrete processes Control Systems. [5+5]

OR

- 11.a) For the differential equation: $x'' + 4x' + 36 = y' + 6y$, obtain transfer function: y/x .
b) Elaborate industrial applications of Robot. [5+5]

---ooOoo---