

**R16**

Code No: 136FK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2019

**INTRODUCTION TO MECHATRONICS**

(Mechanical Engineering)

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) State the trends in mechatronics. [2]
- b) Write about digital i/o devices. [3]
- c) List the applications of precision mechanical systems. [2]
- d) Write the importance of buffer IC's. [3]
- e) Distinguish between relays and solenoids. [2]
- f) Write about analog interfacing. [3]
- g) Define programmable logic controllers. [2]
- h) Write about timers in brief. [3]
- i) Define S curve. [2]
- j) Write about optical incremental encoders. [3]

**PART - B**

**(50 Marks)**

- 2.a) Explain about real time operating systems with an example.
- b) Write about Digital Signal Processing. [6+4]

**OR**

- 3.a) Write about the applications of CIM and SPM.
- b) Describe about filtering noise using passive components. [5+5]

- 4.a) Explain about spindle, spindle bearings and measuring systems.
- b) Write about resettable fuses and thermal dissipation? [5+5]

**OR**

- 5.a) Describe about control software, operator interface, gauging and tool monitoring.
- b) Write about protection schemes in brief. [7+3]

- 6.a) Differentiate between DC brushed motors and DC brushless motors.
- b) Write about pulse width modulation with neat diagram. [5+5]

**OR**

7. Draw the block diagram of 8051 Microcontroller and explain. [10]

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8. Explain about shift registers, master and Jump Controls. [10]

**OR**

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9. Describe about selection of PLC and its applications. [10]

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10. Write about multi axis interpolation, PTP, linear, circular interpolations with neat diagrams. [10]

**OR**

11. Describe about P, PI, PID Controls and Control modes. [10]

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