

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: BTECH**  
**BRANCH: ALL OTHER THAN MECHANICAL**

**SEMESTER : VII**  
**SESSION : MO/2022**

**TIME: 3:00 Hours**  
**SUBJECT: ME389 MECHATRONICS & its APPLICATIONS**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) What is Mechatronics? [2]
- Q.1(b) Give three examples of Mechatronics system. [3]
- Q.1(c) With the help of line and block diagram explain functions of all components of a typical Mechatronic system [5]
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- Q.2(a) What do you mean by following terms as applied to instrumentations for measurement system [2]  
(i)- detector transducer stage (ii)- signal conditioning stage
- Q.2(b) What are AC and DC amplifiers? Explain briefly. [3]
- Q.2(c) Elaborate the difference between a display unit and a recorder. [5]
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- Q.3(a) What do you mean by smart sensors? [2]
- Q.3(b) Sketch and Explain Proximity sensors and mention its advantages. [3]
- Q.3(c) Define Microprocessor, Microcontroller and explain functions of Arithmetic Logic Unit, Register, Control Unit. Also Draw block diagram of Microcomputer. [5]
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- Q.4(a) What is an actuator ? List various types of actuators. [2]
- Q.4(b) State the advantages and applications of stepper motor. [3]
- Q.4(c) Sketch and Explain Pneumatic type of actuators. [5]
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- Q.5(a) What is function of CNC machine? [2]
- Q.5(b) Explain the laws of Robotics. [3]
- Q.5(c) What are the applications of Robots? [5]

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