

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**  
**(MID SEMESTER EXAMINATION MO/2023)**

**CLASS: BTECH**  
**BRANCH: CIVIL /ECE(OE-IV)**

**SEMESTER : VII**  
**SESSION : MO/2023**

**SUBJECT: ME389 MECHATRONICS & ITS APPLICATIONS**

**TIME: 02 Hours**

**FULL MARKS: 25**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL
Q.1(a)	Name and discuss important application areas of Mechatronics.	[2] 2	3
Q.1(b)	Explain Mechatronics systems draw block diagram with elements of Mechatronics system.	[3] 2	2
Q.2(a)	Design a Circuit to perform XOR logic using only NAND Gate.	[2] 2	3
Q.2(b)	Use D Morgan's Laws to show that a NOR gate with inverted inputs is equivalent is an AND gate.	[3] 3	3
Q.3(a)	Explain Sensor and its two characteristics.	[2] 2	3
Q.3(b)	What is OP -AMP. Design an operational amplifier circuit that can be used to produce an output that ranges from 0 to -5v when the input goes from 0 to 100mV.	[3] 3	2
Q.4(a)	Discuss different types of transducers illustrate with an examples.	[2] 2	2
Q.4(b)	Explain different processes that can occur in conditioning a signal.	[3] 3	2
Q.5(a)	Elaborate the difference between a display unit and a recorder.	[2] 3	4
Q.5(b)	Explain PLC's programming Relays, Filters.	[3] 3	3

:::27/09/2023 M:::