

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

**CLASS: BTECH
BRANCH: CIV/ECE/IT.**

**SEMESTER : VII
SESSION MO/2023**

SUBJECT: ME389 MECHATRONICS & ITS APPLICATIONS.
TIME: 3 Hours

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? Explain Mechatronics systems and draw block diagram with elements of Mechatronics system.	[5] 2	3
Q.1(b)	Briefly discuss about important application areas of Mechatronics.	[5] 2	3
Q.2(a)	Explain Sensor and its different characteristics.	[5] 2	2
Q.2(b)	What are AC and DC amplifiers? Explain briefly. Elaborate the difference between a display unit and a recorder.	[5] 2	3
Q.3(a)	Define Microprocessor, Microcontroller and explain functions of Arithmetic Logic Unit, Register, Control Unit. Also Draw block diagram of Microcontroller.	[5] 2	3
Q.3(b)	Elaborate the main objective of a open loop and closed loop control systems.	[5] 3	4
Q.4(a)	Explain about Hydraulic actuators and its functions. Write difference between Hydraulic actuator and Pneumatic actuators.	[5] 2	3
Q.4(b)	How Stepper motor works?. Explain the working principle of Stepper motor with neat sketch.	[5] 3	3
Q.5(a)	Define CNC machine and explain objective of CNC programming. Also discuss about part programming.	[5] 2	3
Q.5(b)	Elaborate the major advantages of NC over conventional methods of machine control.	[5] 3	4

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