Graphic Era
HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (Odd) Semester Examination September 2025

Roll no................................

Name of the Course: B. Tech Mechanical Engg.
Semester: 7th
Name of the Paper: Mechatronics
Paper Code: TME - 708
Time: 1.5 hour   **Maximum Marks: 50**

Note:
  (i)   Answer all the questions by choosing any one of the sub-questions
  (ii) Each question carries 10 marks.

Q1   (10 marks)

(a)   Define mechatronics. Explain its components with neat block diagram and
        suitable examples.

                                                                                         CO1,CO2
OR

(b)   What is signal conditioning? Discuss different methods used in signal
        conditioning.

Q2   (10 marks)

(a)   Explain the working principle of an operational amplifier. Illustrate its
        importance in signal conditioning.

                                                                                         CO1,CO2
OR

(b)   Differentiate between analog and digital signal processing with examples.

Q3   (10 marks) CO1,CO2

(a)   With neat diagrams, **explain the working of a data acquisition system (DAQ)**
        and its significance in Mechatronics.

OR

(b)   Explain the construction, working principle, and applications of DC motors in
        mechatronic systems.

Q4   (10 marks)

(a)   Describe the working principle of a solenoid actuator. How is it used in
        industrial systems?   CO1,CO2

OR

(b)   What are control valves? Discuss their types and how they are used in fluid
        control systems.