

SKEM4333 Mechatronics System Design

Chapter 1 Interactive Quiz Worksheet (Liveworksheet Format)

Student Name: _____

Matric No: _____

Section/Group: _____

Date: _____

Section A: Multiple Choice Questions (ANSWER : A/B/C/D)

1. Who coined the term "Mechatronics" in 1972?

- A) Siemens
- B) Yaskawa Electric
- C) General Electric
- D) MIT

2. Which design approach is characteristic of traditional Electromechanical systems?

- A) Comprehensive parallel design
- B) Concurrent engineering with IT support
- C) Serial design approach (mechanics → electronics → control → software)
- D) Real-time HIL prototyping

3. In real-time simulation, how is Control Prototyping configured?

- A) Real control hardware paired with a real physical process
- B) Simulated control algorithm & hardware paired with a real process
- C) Real control hardware paired with a simulated process
- D) Fully simulated process without hardware

4. In Hardware-in-the-Loop (HIL) simulation, which component is real and which is simulated?

- A) Real control hardware paired with a simulated process
- B) Real physical process paired with simulated control hardware
- C) Both process and control hardware are fully simulated
- D) Both process and control hardware are physical prototypes

5. In writing design specifications, how are "Demands (D)" defined?

- A) Optional features rated between 1 and 5
- B) Requirements that should be taken into consideration whenever possible
- C) Requirements that must be met under all circumstances; otherwise, the solution is unacceptable
- D) Recommendations provided by the sales team

Section B: Fill-in-the-Blanks Questions

Instructions: Complete each sentence by writing the missing term in the blank space provided.

6. Mechatronics is the synergistic integration of _____ with _____ and _____ in designing and manufacturing products.
7. The four fundamental fields of knowledge in mechatronics are Mechanical systems, Electronics systems, Control systems, and _____.
8. Requirements in a specification list that should be taken into consideration whenever possible are classified as _____.
9. To rate customer requirements in a specification list, an importance scale from _____ is assigned, where 10 represents the most important requirement.

Mechanical engineering

Computer systems / IT

1 to 10

intelligent computer
control

Electronics

Wishes (W)

Section C: Matching Questions

Instructions: Match each item in Column A with its corresponding description in Column B.

Column A (Concepts / Tools)	Column B (Descriptions / Examples)
10. Electromechanical System	
11. Mechatronics System	
12. CAD/CAE Tools	
13. Design Requirement List	

Examples include MATLAB-Simulink, LabVIEW, OrCAD, and SolidWorks

Uses a serial design approach where constraints pass sequentially to subsequent stages

The document representing specifications against which design success is judged

Uses a parallel/concurrent design approach supported by IT/CAD at each stage