PART-A

1. List any two key features of CPS
2. Name two sensors used in CPS.
3. State the uses of Wireless Hart.
4. Give one example of CPS in medical applications.
5. Name one benefit of using synchronous design.
6. What is determinism in the context of component properties?
7. How do reactive components differ from transformational components?
8. Mention two examples of reactive systems.
9. Define composability in software components.

10. List any two essential properties of a software component.

PART-B

1. Describe the role of CPS in Industry 4.0 and IIoT with relevant use cases.
2. Discuss how building automation uses CPS for energy efficiency and safety.
3. Illustrate how determinism and reusability are achieved in component-based design.
4. Explain the importance of platform components in CPS architecture.
5. Differentiate between synchronous and asynchronous design with examples.
6. Explain the concept of reactive components with examples from real-time systems.

PART-C

1. Analyze the challenges of scheduling real-time control tasks in CPS

using RTOS.

2. Evaluate how AutoSAR helps in managing CPS complexity in the automotive sector.

3. Consider the design of an automotive airbag control system as a real-time embedded system. Using this as a case study, explain how the properties of components — modularity, reusability, and composability — impact its system design.

4. Consider a smart building's automated HVAC system that adjusts temperature and air quality based on real-time occupancy data. Using this as a case study, compare the key properties of reactive components and explain how they contribute to system reliability.