

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 6 – EXAMINATION – SUMMER 2026

Subject Code: 3161011

Date: 26/05/2026

Subject Name: Cyber Physical systems

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1** (a) Define Cyber Physical Systems (CPS). **03**
List any three applications of CPS.
- (b) Explain any two sensors in context of unman car design in CPS. **04**
- (c) Discuss Industry 4.0 and its impact on CPS. **07**
- Q.2** (a) What is CAN protocol? **03**
- (b) Describe Wireless HART network. **04**
- (c) Discuss CPS networks and communication protocols. **07**
- OR
- Q.2** (c) Explain hardware-software co-design in CPS. **07**
- Q.3** (a) What is ECU? Describe in brief. **03**
- (b) Explain mapping software components to ECUs. **04**
- (c) Explain CPS engineering process with diagram. **07**
- OR
- Q.3** (a) What is network congestion? **03**
- (b) Describe low-level and high-level control. **04**
- (c) Discuss effect of scheduling and latency on CPS performance. **07**
- Q.4** (a) Describe Hybrid Automata. **03**
- (b) Explain CPS software verification. **04**
- (c) Explain hybrid automata modeling with tools. **07**
- OR
- Q.4** (a) Describe flowpipe construction. **03**
- (b) What is reachability analysis? **04**
- (c) Discuss formal analysis techniques in CPS. **07**
- Q.5** (a) Define cyber security in CPS. **03**
Explain privacy in context of CPS applicataion ?
- (b) Explain CPS security challenges. **04**
- (c) Discuss various CPS attack models with examples. **07**

OR

Q.5	(a) Describe side channel Attack.	03
	(b) Describe threats in automotive CPS.	04
	(c) Explain security and privacy issues in CPS domains.	07
