

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3161011

Date:20-05-2024

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.

		Marks
Q.1	(a) What are basic principles of design and validation of CPS.	03
	(b) Write about the industrial internet of things (IIOT) implications?	04
	(c) How Cyber Physical System used in Industry 4.0?	07
Q.2	(a) How are the Human and CPS related to each other?	03
	(b) What is RTOS? Explain it in detail.	04
	(c) Explain the Basic principles of CPS involved in medical application.	07
	OR	
	(c) How is CPS impacted by network congestion?	07
Q.3	(a) Describe CAN bus protocol in detail.	03
	(b) Explain Low level Control model of CPS.	04
	(c) Discuss advanced Automata based modeling using an example.	07
	OR	
Q.3	(a) Define the bus latency.	03
	(b) Discuss Wireless HART in detail.	04
	(c) How Privacy maintained in CPS.	07
Q.4	(a) List out the application of CPS in real world.	03
	(b) Describe the sense and actuation errors in the CPS.	04
	(c) Explain Automotive Ethernet in detail.	07
	OR	
Q.4	(a) What are the effects of scheduling	03
	(b) Describe Human Computer Interface (HCI) in detail	04
	(c) How Scheduling used in RTOS for Real Time control tasks.	07
Q.5	(a) Describe the CPS High Level Control model.	03
	(b) Write about the weakest preconditions in CPS software.	04
	(c) Explain any one CPS Attack model.	07
	OR	
Q.5	(a) Why mapping of software components to ECUs is important in CPS engineering?	03
	(b) How industrial domain is impacted by threats to CPS.	04
	(c) How Cyber Physical System can be verified using Frama-C software.	07
