

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023

Subject Code:3161011

Date:10-07-2023

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) Differentiate Hard real time and soft real time in an embedded system	03
	(b) Define CPS and contradictions in CPS.	04
	(c) With the help of a block diagram, explain Cyber Physical System architecture.	07
Q.2	(a) Explain the various ways of memory allocation in RTOS	03
	(b) Differentiate I/O mapped I/O and Memory Mapped I/O	04
	(c) Explain various terminologies in reference to sensor selection for embedded application.	07
	OR	
	(c) How threats to CPS affect industrial automation	07
Q.3	(a) Explain various modes of communication protocol in Automotive domain.	03
	(b) What are the effects of bus latency in scheduling?	04
	(c) Write a note on Network congestion w.r.t. CPS	07
	OR	
Q.3	(a) Write a note on scheduling in real time environment	03
	(b) What is Basic principles of design and validation of CPS	04
	(c) Explain Advanced Automata based modeling and analysis using an example	07
Q.4	(a) Explain Human Computer Interface (HCI) in detail	03
	(b) Differentiate tasks, threads and process	04
	(c) List down the various hardware and software components of CPS and explain in detail	07
	OR	
Q.4	(a) Write a note on authentication in CPS	03
	(b) What is RTOS? Explain it in detail.	04
	(c) What is IIOT implications? Explain it in detail.	07
Q.5	(a) Explain low level Control model of CPS	03
	(b) Write a note on two state process model	04
	(c) What is AutoSAR? Explain it in detail	07
	OR	

Q.5	(a)	Write a note on Wireless HART	03
	(b)	List various industrial revolution and their features	04
	(c)	Write a note on Frama - C	07