

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3171930****Date:16-12-2023****Subject Name: Industrial Internet of Things****Time: 0:30 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) What is Industrial Internet of Things (IIoT)? What are the key components of an IIoT system? **03**
- (b) How can IIoT be used to improve worker safety in factories? **04**
- (c) Explain emerging trends in the integration of IIoT and Cyber Physical Systems. **07**
- Q.2** (a) What is Cyber Physical Engineering (CPE) and how is it applied in manufacturing? **03**
- (b) How can Cyber Physical Engineering and model-based engineering be used to improve the design and operation of cyber physical production systems? **04**
- (c) What is model-based engineering and how can it be used to develop supervisory controllers for cyber physical systems? **07**
- OR**
- (c) What is an evaluation model for assessing cyber physical production systems, and how can it be used to improve system performance? **07**
- Q.3** (a) What is CPS-based manufacturing and how does it relate to Industry 4.0? **03**
- (b) How can knowledge base and data base integration be used in conjunction with machine vision to improve manufacturing processes? **04**
- (c) What are some emerging trends in CPS-based manufacturing, and how are they expected to impact the industry? **07**
- OR**
- Q.3** (a) What are some benefits of using CPS to enhance resiliency in production facilities? **03**
- (b) What are some challenges in implementing CPS-based manufacturing systems? **04**
- (c) How can CPS-based manufacturing systems be optimized for efficiency and sustainability? What are some examples of sustainable manufacturing practices enabled by CPS? **07**
- Q.4** (a) How is CPS applied in machine tools? **03**
- (b) What is big data, and how is it used in conjunction with machine learning in CPS? **04**
- (c) What is digital production, and how does it relate to CPS? What are some examples of digital production technologies? **07**
- OR**
- Q.4** (a) What are some benefits of using CPS in machine tools? **03**
- (b) What are some challenges in implementing CPS in machine tools? **04**
- (c) How can CPS be used to improve quality control in manufacturing? What are some examples of CPS-based quality control systems? **07**
- Q.5** (a) Enlist Strategies to support user intervention. **03**
- (b) What is city automation, and how does it relate to CPS? **04**

- (c) What is smart metering, and how is it used in CPS-based manufacturing? **07**
What are some examples of smart metering applications in industry?

OR

- Q.5** (a) List examples of CPS-based quality control systems? **03**
(b) What is home automation, and how does it relate to CPS? **04**
(c) What are some real-life examples of IIoT in the manufacturing sector? **07**
How are these systems being used to improve productivity, efficiency, and sustainability in industry?
