



AUTUMN END SEMESTER EXAMINATION-2024

3rd Semester B.Tech

INDUSTRY 4.0 TECHNOLOGIES

EX20001

(For 2024 (L.E), 2023 & Previous Admitted Batches)

Time: 2 Hours 30 Minutes

Full Marks: 50

Answer any FIVE questions.

Question paper consists of three SECTIONS i.e. A, B and C.

Attempt minimum one question each from each Section.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

SECTION-A

1. (a) Explain the concept of block chain and describe the process of adding blocks. How does this technology enhance security in the banking sector? [5]
- (b) What are the key components of IIoT (Industrial Internet of Things)? Analyze the similarities and differences between IIoT and cyber physical system using relevant examples. [5]
2. (a) What are the key enabling technologies for the implementation of Industry 4.0? Describe the method used for the development of 3D physical object. [5]
- (b) Evaluate the significance of Artificial Intelligence and Big Data for weather prediction systems. Analyze the interdependence of these technologies and how they work together to improve forecasting accuracy. [5]

SECTION-B

3. (a) Analyze the key features of Augmented Reality (AR) and discuss how it differs from Virtual Reality (VR). Assess how VR has transformed medical education and training practices. [5]
- (b) What is mobile computing? Explain How does mobile computing enhance business productivity? What security challenges are associated with mobile computing? [5]
4. (a) Analyze the concept of Cyber-Physical Systems (CPS) and explain its different components. Evaluate how CPS can enhance performance and efficiency in the transport sector. [5]
- (b) Evaluate the differences between digital twins and simulations. Analyze the various components of a digital twin and discuss how digital twin technology improves the performance and efficiency of building construction projects. [5]
5. (a) What impact does Industry 4.0 have on production in agriculture? What are the benefits of using drones in agricultural monitoring and management? [5]
- (b) How can digital twins be used in the automobile sector? BMW's digital twin factories support sustainability, efficiency, and digital transformation goals. [5]

SECTION-C

6. (a) Provide an example of an industry that has undergone transformation using Industry 4.0 technologies. Analyze how the technologies as AI, Big data, cloud computing, additive manufacturing were integrated into their existing operations and discuss the impact of this integration on their overall performance. [5]

- (b) Identify the nine pillars of Industry 4.0 and evaluate their applications in the agriculture sector. Discuss how these technologies can transform agricultural practices and enhance productivity. [5]
7. (a) Compare the advantages of implementing Industry 4.0 in industries over those of Industry 3.0. Evaluate the various challenges faced by small and medium-sized enterprises (SMEs) in adopting Industry 4.0 technologies. [5]
- (b) Discuss the various types of cloud computing and analyze the challenges may face by the organization when implementing the cloud computing. [5]
