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Eighth Semester B.Tech. Degree Examination, June/July 2024 Advanced Smart Manufacturing and Techniques

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Briefly explain : i) Sensors ii) Actuators iii) Communication protocols in IoT. (10 Marks)
- b. Illustrate the importance of smart manufacturing in modern industry with example.(10 Marks)

OR

- 2 a. Write on overview of smart manufacturing concepts and principles. (10 Marks)
- b. Write a fundamental of IoT and its applications in manufacturing. (10 Marks)

Module-2

- 3 a. Write a note on overview of AI technologies and their role in manufacturing. (10 Marks)
- b. Explain the following terms : i) Data Pre-processing ii) Cleaning techniques. (10 Marks)

OR

- 4 a. Define Big data analytics. Write its significance in manufacturing. (10 Marks)
- b. Explain machine learning algorithms for predictive maintenance. (10 Marks)

Module-3

- 5 a. Write and explain applications for 3D printing in prototyping, customization and production. (10 Marks)
- b. Illustrate multi material printing with a neat sketch. (10 Marks)

OR

- 6 a. Define Additive manufacturing. Explain the fundamental of additive manufacturing process and materials. (10 Marks)
- b. What are the steps involved in any type of 3D printing techniques? Explain each slip briefly. (10 Marks)

Module-4

- 7 a. Explain integration of digital twins with IoT data and simulation tools? (10 Marks)
- b. Write a note on case studies on using digital twins predictive maintenance. (10 Marks)

OR

- 8 a. Explain the concept of digital twins and their role in smart manufacturing. (10 Marks)
- b. Illustrate the process of optimization and product life cycle management. (10 Marks)

Module-5

- 9 a. Write note on : i) Quantum computing ii) Block chain (10 Marks)
- b. Write a note on block chain for supply chain transparency. (10 Marks)

OR

- 10 a. Illustrate an overview of emerging technology shaping the future of smart manufacturing. (10 Marks)
- b. Write the applications of
 - i) Augmented Reality (AR) in manufacturing
 - ii) Virtual Reality (VR) in manufacturing
(10 Marks)