

Register No.: ..... Name.: .....

## **SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

### **FOURTH SEMESTER MBA DEGREE EXAMINATION (R,S), MAY 2024 (2021 Scheme)**

**Course Code : 21MBA204**

**Course Name: Industry 4.0**

**Max. Marks : 60**

**Duration: 3 Hours**

#### **PART A**

***(Answer all questions. Each question carries 2 marks)***

1. Explain the concept of Industry 4.0 and its key features.
2. Recall Block Chain technology.
3. What are the business model components of industrial IoT?
4. What is frugal innovation?
5. Identify two common challenges faced by industries when it comes to cybersecurity.

#### **PART B**

***(Answer any 3 questions. Each question carries 10 marks)***

6. Evaluate the major challenges associated with the implementation of Industry 4.0 technologies and strategies in modern industries.
7. Analyze the role of Big Data Analytics, Blockchain, and Machine Learning in creating Smart Cities and how these technologies work together to manage and optimize city infrastructure, transportation, and energy usage?
8. Analyze the impact of Industrial IoT on different functional areas of an organization, including human resource management, finance, marketing, and operations. Provide examples of how companies have successfully integrated Industrial IoT into these areas and the benefits that have been realized as a result.
9. Analyze the importance of continuous adaptive learning in the context of changing consumer expectations and the rise of collaborative innovation. How can organizations foster a culture of continuous learning and adaptability?
10. Critically evaluate the cyber security measures currently in place in various industries, including the strengths and weaknesses of these measures and their effectiveness in protecting against cyber-attacks.

**PART C**

***(Compulsory question, the question carries 20 marks)***

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Nextronix, a global technology leader in electrification, automation, and digitalization, has leveraged Industry 4.0 to transform its manufacturing processes and enhance productivity and efficiency. The company's digital factory in Dresden, Germany, is a prime example of how Industry 4.0 technologies can be used to create smart, connected factories that enable better decision-making and more efficient operations.

The digital factory at Dresden features a highly automated production process, with over 1,100 robots and 75 automated guided vehicles (AGVs) working in tandem with human workers. The factory uses a wide range of Industry 4.0 technologies, including IoT sensors, data analytics, and machine learning algorithms, to optimize production processes and reduce downtime.

One key aspect of Nextronix's Industry 4.0 strategy is its use of a Manufacturing Execution System (MES), which provides real-time visibility into production processes and allows for better coordination of workflows. The MES enables the company to track and monitor every step of the production process, from raw materials to finished products, and identify any issues that may arise in real-time.

Nextronix also uses digital twins, which are virtual replicas of physical assets that enable engineers to simulate and optimize production processes before they are implemented in the real world. The company uses digital twins to design and test new products and production processes, minimizing the risk of errors and reducing time-to-market.

A wide range of energy-efficient technologies are also implemented in its digital factory, including heat recovery systems, LED lighting, and intelligent building management systems. These technologies have helped the company reduce its energy consumption and carbon footprint, while also improving the working environment for employees.

Overall, the use of Industry 4.0 technologies has enabled the company to achieve significant improvements in productivity, quality, and efficiency, while also reducing costs and enhancing sustainability. By embracing digital transformation and creating a smart, connected factory, Nextronix

has positioned itself as a leader in the fourth industrial revolution.

a) How has Nextronix leveraged Industry 4.0 to create a smart, connected factory that enables better decision-making and more efficient operations?

Mark(8)

b) Analyze the benefits of Nextronix's Industry 4.0 strategy, including its use of digital twins, energy-efficient technologies, and a Manufacturing Execution System (MES).

Marks (6)

c) What lessons can other companies learn from Nextronix's approach to digital transformation?

Marks (6)

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