BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – M.Tech.(RA)-2023
Course Name – Industry 4.0
Course Code - PEC-MIRA302A
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify the key feature of Industry 4.0.
   a) Manual labor-intensive processes b) Centralized decision-making
   c) Real-time data analytics d) Limited connectivity

(ii) Express the primary goal of Industry 4.0.
   a) Reduce automation b) Increase manual labor
   c) Optimize production d) Ignore technology

(iii) Select the vital technology for real-time data analysis in Industry 4.0.
   a) Abacus b) Spreadsheets
   c) Cloud computing and AI d) Paper-based logs

(iv) Select the role of artificial intelligence (AI) in Industry 4.0.
   a) No role, it's irrelevant b) It enables automation and data analysis
   c) AI hinders progress in Industry 4.0 d) AI only works in traditional factories

(v) Identify what IIoT stands for.
   a) Industrial Internet of Things b) Internet of Services
   c) Internet of Data d) Internet of People

(vi) Identify the sector that focuses on producing food more efficiently using Industry 4.0 technologies.
   a) Food Industry b) Pharmaceutical Industry
   c) Textile Industry d) Construction Industry

(vii) Select the central idea behind "smart logistics" in Industry 4.0.
   a) Optimizing supply chain operations b) Increasing manual labor
   c) Minimizing technological integration d) Reducing customer satisfaction

(viii) Categorize what the term "Robotic Automation" primarily refers to in Industry 4.0.
   a) Using human labor b) Incorporating robots into manufacturing processes
   c) Ignoring automation altogether d) Training parrots to do tasks

(ix) Identify the primary focus of Industry 4.0 concerning handwritten notes.

a) Encouraging handwritten documentation
b) Ignoring handwritten notes
c) Promoting the use of quill pens
d) Embracing the digital age

(x) Identify the selection process of materials and equipment primarily involved in 3D printing in Industry 4.0.

a) Ignoring materials and equipment
b) Choosing materials and equipment without consideration
c) Thoughtfully selecting the right materials and equipment for specific applications
d) Picking materials randomly

(xi) Choose the key advantage of 3D printing in product development within Industry 4.0.

a) Mass production capabilities
b) Customization and rapid prototyping
c) Slower development times
d) Limited design freedom

(xii) Categorize the primary focus of an IIoT case study.

a) Studying cases of industrial accidents
b) Examining real-world implementations of Industrial Internet of Things (IIoT)
c) Investigating the history of the internet
d) Ignoring industrial technologies

(xiii) Select the term "IIoT" stands for in Industry 4.0.

a) International Internet of Things
b) Industrial Internet of Things
c) Irritating Ideas of Technology
d) Irrelevant Internet of Technology

(xiv) Identify the primary focus of studying IIoT case studies in Industry 4.0.

a) To discourage technology adoption
b) To learn from real-world implementations of IIoT in different industries
c) To create fictional case studies
d) To avoid the study of IIoT

(xv) Choose the primary goal of strategies for competing in Industry 4.0.

a) To maintain traditional business practices
b) To adapt and thrive in a technology-driven world
c) To eliminate competition
d) To ignore technology advancements

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Discuss how the concept of a "smart workpiece" contributes to manufacturing efficiency, traceability, and quality control. (3)
3. Enumerate how cyber security is a critical concern in the implementation of Industry 4.0 technologies, and what are the main threats and vulnerabilities. (3)
4. Analyze how the integration of 3D printing technology into the manufacturing process enables rapid prototyping and product development in Industry 4.0. (3)
5. Describe the concept of the networked economy and its significance in the context of Industry 4.0. (3)
6. Delve into the significance of collaboration and strategic partnerships among companies and industries as a means to thrive in the Industry 4.0 era. (3)

OR

Explain how sustainability and responsible business practices align with Industry 4.0, and what strategies should companies employ to reduce their environmental footprint while remaining competitive. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Provide examples of how CPS are transforming traditional manufacturing processes and systems. (5)
8. Define Industry 4.0 and explain how it differs from previous industrial revolutions. (5)

9. Explain how the concept of smart cities is interconnected with IIoT technologies, and what tangible improvements have been observed in urban infrastructure and services. (5)
10. Illustrate how IoT-enabled medical devices, wearable health technology, and telemedicine are reshaping the healthcare landscape, particularly in remote patient monitoring and virtual care. (5)
11. Discuss the potential ethical and privacy concerns associated with the extensive use of data in Industry 4.0 applications. (5)
12. Enumerate examples of how IoT and IIoT are being used to create smart devices and products in various industries. (5)

OR

Examine the role predictive analytics plays in optimizing production processes and decision-making in the Industry 4.0 era. (5)

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