| Reg. No. | | | | | | | | | | | | | | | |
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| Question Paper Code | 13435 |
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025**

Seventh Semester

**Electronics and Instrumentation Engineering**

**20ICEL703 - INDUSTRIAL INTERNET OF THINGS**

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

**PART - A (MCQ) (10 × 1 = 10 Marks)**

Answer ALL Questions

| | | Marks | K – Level | CO |
|---|---|---|---|---|
| 1. | What is the full form of IIoT?<br>(a) Industry Internet of Thing (b) Industrial Internet of Things<br>(c) Integration Internet of Things (d) Idea Internet of Things | 1 | K1 | CO1 |
| 2. | A central hub is used in which of the following topology?<br>(a) Star (b) Bus (c) Ring (d) Mesh | 1 | K1 | CO1 |
| 3. | What does conversion refer to in context of CPS architecture for IIoT?<br>(a) Conversion of CPS into individual components<br>(b) Conversion of machine data to meaningful information<br>(c) Conversion of present data into future data prediction<br>(d) Conversion of analog signal to digital signal | 1 | K1 | CO2 |
| 4. | Select the statement which describes one of the limitations of smart sensors.<br>(a) Sensor data aggregation not possible (b) Cannot connect with an actuator.<br>(c) Cannot connect to a network (d) All of the above | 1 | K1 | CO2 |
| 5. | Which of the following network topology/(ies) is/are not supported by EtherCat?<br>(a) tree (b) hybrid (c) star (d) mesh | 1 | K1 | CO3 |
| 6. | What is the maximum data rate per packet of EtherNet/IP?<br>(a) 500 bytes (b) 100 bytes (c) 1500 bytes (d) 2000 bytes | 1 | K1 | CO3 |
| 7. | Amazon Web Service is a _____ cloud.<br>(a) public (b) private (c) hybrid (d) community | 1 | K1 | CO4 |
| 8. | Which one of the following is not a characteristic of a good SLA?<br>(a) Mutually Acceptable (b) Quantifiable (c) Refundable (d) Controllable | 1 | K1 | CO4 |
| 9. | How does the usage of IoT benefit the Oil and Gas industries?<br>(a) Decrease production efficiency (b) Save cost and time<br>(c) Diminish work safety (d) Reduce Production | 1 | K1 | CO5 |
| 10. | Which of the following can be achieved by performing predictive maintenance using IoT in the chemical industry?<br>(a) Increased equipment breakdown<br>(b) Improve quality by efficient IoT analytics programs<br>(c) Deteriorating service<br>(d) None of the above | 1 | K1 | CO5 |

**PART - B (12 × 2 = 24 Marks)**

Answer ALL Questions

| | | Marks | K – Level | CO |
|---|---|---|---|---|
| 11. | Compare renewable and non-renewable sources. | 2 | K2 | CO1 |
| 12. | What are the classifications of actuators? | 2 | K1 | CO1 |
| 13. | List the advantages of XMPP. | 2 | K1 | CO1 |
| 14. | Compare the differences between CPS and Embedded Systems. | 2 | K2 | CO2 |
| 15. | What are Next-Generation Sensors? | 2 | K1 | CO2 |
| 16. | What are the limitations of Smart Sensors? | 2 | K1 | CO2 |
| 17. | Mention two commonly used industrial sensor. | 2 | K1 | CO3 |

| | | | | | |
|---|---|---|---|---|---|
| 18. | Mention the advantages of WSAN. | | *2* | *K1* | *CO3* |
| 19. | Differentiate between K -Means and fuzzy-c Means algorithm. | | *2* | *K2* | *CO4* |
| 20. | List the R operators. | | *2* | *K1* | *CO4* |
| 21. | What is the need for Software Security? | | *2* | *K1* | *CO5* |
| 22. | What are the challenges of IIOT in Industries? | | *2* | *K1* | *CO5* |

**PART - C (6 × 11 = 66 Marks)**

Answer ALL Questions

| | | | | | |
|---|---|---|---|---|---|
| 23. | a) | What are the classifications of sensors? Explain in detail. | *11* | *K2* | *CO1* |
| | | **OR** | | | |
| | b) | Explain the different components of smart factories. | *11* | *K2* | *CO1* |
| 24. | a) | Explain the CPS architecture for IIoT in detail. | *11* | *K2* | *CO2* |
| | | **OR** | | | |
| | b) | Explain the concept of PLM solution in Industry 4.0 with a step by step approach. | *11* | *K2* | *CO2* |
| 25. | a) | Explain any two commonly used industrial sensor in detail. | *11* | *K2* | *CO3* |
| | | **OR** | | | |
| | b) | Explain in detail about three-tier architecture of IIRA. | *11* | *K2* | *CO3* |
| 26. | a) | Explain the architecture of SDN in detail. | *11* | *K3* | *CO4* |
| | | **OR** | | | |
| | b) | Explain IIOT Analytics in machine learning. | *11* | *K3* | *CO4* |
| 27. | a) | Explain the working of pharmaceutical industry in IIOT. | *11* | *K2* | *CO5* |
| | | **OR** | | | |
| | b) | Describe the challenges in IIOT Applications. | *11* | *K2* | *CO5* |
| 28. | a) (i) | Interpret the IIOT Analytics with aircraft application. | *6* | *K2* | *CO4* |
| | (ii) | Examine the smart grid power system. | *5* | *K2* | *CO5* |
| | | **OR** | | | |
| | b) (i) | What is Hadoop? Describe about Hadoop distributed File system. | *6* | *K2* | *CO4* |
| | (ii) | Describe about Inventory Management & Quality Control. | *5* | *K2* | *CO5* |