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Question Paper Code: U5304

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Fifth Semester

Electrical and Electronics Engineering

21UEE504 - INTERNET OF THINGS FOR ELECTRICAL AUTOMATION

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State any two key characteristics of the Internet of Things. **CO1- U**
2. Name two common communication models used in IoT applications. **CO1- U**
3. In what practical application would you choose a capacitive sensor over a resistive sensor? Explain. **CO2-App**
4. Describe a situation where you would select an ultrasonic sensor for distance measurement. **CO2-App**
5. In what practical application would you choose a stepper motor over a DC motor, and why? **CO2-App**
6. Describe a scenario where solid-state switches are advantageous over mechanical switches in terms of reliability. **CO2 -App**
7. Describe the primary function of an Integrated Development Environment (IDE) when programming Arduino boards. **CO2-App**
8. Compare and contrast the key differences between Raspberry Pi and Arduino boards, focusing on their hardware capabilities and use cases. **CO3-Ana**
9. Compare and contrast the differences between industrial automation and smart traffic control applications in a smart city in terms of their objectives and technologies involved. **CO4-Ana**
10. Evaluate the potential challenges and benefits of implementing a smart grid system in a densely populated urban area within a smart city context. **CO5-Ana**

PART – B (5 x 16= 80Marks)

11. (a) Illustrate the logical design of IoT in detail. CO1- U (16)
Or
(b) Summarize the physical design of IoT in detail. CO1 -U (16)
12. (a) Explain the working principle of a resistive sensor and provide an example of its use in a practical application. CO1- U (16)
Or
(b) Describe how capacitive sensors work, including their basic construction and their sensitivity to changes in capacitance. CO1- U (16)
13. (a) Draw and explain various types of Electrical Actuation Systems. CO1-U (16)
Or
(b) Sketch the Solid-state switches sensor and explain its operation. CO1- U (16)
14. (a) Discuss the primary components of a typical Raspberry Pi setup for IoT projects. CO3- Ana (16)
Or
(b) Discover the process of customizing a SoC for specific application requirements. CO3- Ana (16)
15. (a) Illustrate the significance of data analytics and AI in optimizing various aspects of a smart city. CO5- U (16)
Or
(b) Describe initiatives to reduce environmental impact and promote sustainability through IoT-enabled industrial automation. CO5- U (16)