FIRST SEMESTER B.Voc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC21U SDC1 IE01 - INTRODUCTION TO IOT AND ELECTRONICS

(Information Technology)

(2021 Admission onwards)

Time : 2.5 Hours   Maximum : 80 Marks

Credit : 4

Part A (Short answer questions)

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

1. Explain the forward bias and reverse bias conditions of a p-n junction diode.

2. Describe rectification and its significance.

3. Define the purpose of a filter capacitor in a rectifier circuit?

4. Define a transistor and explain its primary function in electronic circuits.

5. How do output characteristics illustrate the operation of a BJT in the common emitter configuration?

6. How does an op-amp function in a subtractor circuit?

7. What is the significance of the most significant bit (MSB) in a signed binary number?

8. State De Morgan's laws.

9. What is the output of a NOT gate when the input is 1?

10. What is the difference between a latch and a flip-flop?

11. What is the primary difference between ECL and TTL in terms of speed?

12. What is the purpose of a multi-core processor?

13. Mention the key components of IoT.

14. What is a MAC protocol?

15. Name two applications of IoT in home automation.

(Ceiling: 25 Marks)

Part B (Paragraph questions)

Answer *all* questions. Each question carries 5 marks.

16. Define the Zener diode and explain its role as a voltage regulator.

17. Compare the Inverting and Non-Inverting Op-Amp Configurations.

18. Derive the excitation table for a T flip-flop.

19. Explain the design of a hardwired control unit using combinational logic.

20. Discuss the process of converting high-level language to machine code.

21. Describe the function of timers and counters in the 8051 microcontroller.

22. Explain how IoT APIs enable data exchange between devices.

23. Discuss the importance of network architecture in IoT.

(Ceiling: 35 Marks)

Part C (Essay questions)

Answer any *two* questions. Each question carries 10 marks.

24. Convert the decimal number 1234 into its equivalent binary, octal, and hexadecimal forms. Show each step clearly and explain the methods used.

25. Compare and Analyse the operations of a half adder and a full adder in terms of their logic, functionality, and hardware complexity.

26. Analyse the evolution of computer architecture from the first generation to the present day.

27. Analyse how security challenges impact the large-scale deployment of IoT systems.

(2 × 10 = 20 Marks)

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