State Exam Topics

Digital Logic Design

For Embedded Microcomputer Systems Specialization

1. Define the following terms: logical network, logical values, logical variables, Boolean-algebra.
2. Boolean-algebra. What are the basic logical operations and identities? What is a logical function?
3. Canonical form of a logical function. Explain the minterm and maxterm forms!
4. What methods can be used to simplify or reduce a logical function?
5. What are the symmetric logical functions? Realization of logic gates.
6. Types of hazards, their causes and how can we resolve them.
7. Asynchronous sequential networks, state tables and state diagrams.
8. Synchronous sequential networks, state tables and state diagrams.
9. Basic sequential networks, flip-flops.
10. Edge-triggered and master-slave flip-flops.
11. Frequency dividers and counters.
12. Asynchronous and synchronous counters.
13. Registers, encoders and decoders, multiplexers and demultiplexers.
14. Types of memories, their structure and properties.
15. Types of number representation in digital systems.
16. Architectural elements of a microprocessor.
17. Types of buses, common bus signals and their theory of operation.
18. Interrupts, interrupt sources and interrupt handling.
19. Comparison of microprocessors and microcomputers, typical architectures.
20. The function of stack and its usage.
21. Classification of integrated circuits according to their application.
22. Comparison of discrete, ASIC and PLD circuits.
23. Types of simple PLD-s, their architecture and properties.
24. Types of advanced PLD-s, their architecture and properties.