

Question bank of B Sc MECs V Semester

Subject: Electronics

Paper: V

Subject Title: Digital Electronics

UNIT – I (Number System and Logic gates)

Short answer Type

1. Define different types of Number systems.
2. Conversion of Number systems.
3. Finding 2's complement.
4. What is a logic family?
5. List all the parameters of Logic families.
6. Write the applications of TTL logic.
7. What are the advantages and disadvantages of CMOS over TTL logic?
8. What is a Half adder?

Essay Answer Type

1. Subtraction using 2's complement.
2. What are logic gates? Explain about different logic gates with their symbols and truth tables.
3. What is a Universal gate? Explain how NAND and NOR are used as Universal gates.
4. Draw and explain the operation of full adder circuit with their truth table and construct full adder using two half adder.
5. Explain the working of 4-bit parallel adder circuit using full adders.
6. Explain the characteristics of logic families.
7. Explain TTL logic with neat circuit diagram.
8. Explain CMOS logic with neat circuit diagram.
9. Explain ECL logic with neat circuit diagram.

UNIT- II (Boolean Algebra and Combinational Logic circuits)

Short Answer Type

1. List out the postulates of Boolean algebra.
2. State De-Morgan's theorems.
3. What are the minterms and maxterms?
4. What is a combinational logic circuit?
5. What is a multiplexer?
6. What is a demultiplexer?
7. What is a decoder?
8. What is an encoder?
9. List the applications of encoders and decoders.

Essay Answer Type

1. State and prove the laws of Boolean algebra.
2. State and prove De-Morgan's theorems.
3. Simplification of logic expressions using postulates and De-Morgan's theorems.
4. What are SOP and POS forms of logical functions? Explain the standard and canonical SOP and POS forms.
5. Explain K-Map.
6. Explain in brief about pair, quad and octet.
7. Draw and explain the operation of multiplexer.
8. Draw and explain the operation of demultiplexer.
9. Draw and explain the operation of 3X8 decoder.

UNIT-III (Sequential Logic circuits)

Short Answer Type

1. What is a sequential logic circuit?
2. Distinguish between combinational and sequential logic circuits.
3. Write about level triggering and edge triggering.
4. Write about race around condition.
5. Define register and state the need for a register.
6. Give the applications of ring counter.

Essay Answer Type

1. Draw and explain RS flip-flop with truth table.
2. Draw and explain JK flip-flop with truth table.
3. Draw and explain D and T flip-flops with their truth tables.
4. Explain in detail about shift registers. (4 bit shift register).
5. Explain the working of serial-in-serial-out shift register.
6. Explain the working of parallel-in-serial-out register.
7. Explain the working of universal shift register.
8. Draw the circuit diagram of a 4-bit ring counter and explain using corresponding timing diagrams.
9. Draw the circuit diagram of a Johnson counter and explain its operation.
10. Explain the differences between ring and Johnson counters. Design and explain the operation of a decade Johnson counters.

UNIT-IV (Counters and Semiconductor memories)

Short Answer Type

1. What is a counter?
2. Define modulus of a counter.
3. What is a ripple counter and list the drawbacks of it.
4. Write the difference between synchronous and asynchronous counters.

5. Explain the features of different semiconductor memories.
6. What is a ROM?
7. Compare static and dynamic ROM.

Essay Answer Type

1. Draw and explain the working of 3 bit up/down synchronous counter.
2. Draw and explain the working of 3 bit up/down asynchronous counter.
3. Compare synchronous and asynchronous counters.
4. Explain the working of decade counter using IC 74XX.
5. Define the following.
 - a) Read operation
 - b) Write operation
 - c) Access time
 - d) Capacity
 - e) Address lines and
 - f) Word length.
6. Explain briefly about semiconductor memories.
7. Distinguish between ROM and RAM.

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