Karanjia Auto College,Karanjia,Mayurbhanj

CC-X

DIGITAL SYDTEMS & APPLICATIONS 1. Q1. (1 Mark)

2. The base or radix of binary number system is:
3. How many bits are their in one byte ?
4. How many bits are there in one nibble ?
5. How many digits are there in octal number
6. What is the number of digits of hexadecimal?
7. In 2's complement and binary 01001011 is equal to_____.
8. What is the equivalent binary number of Decimal equivalent of 567, is_____.
9. Decimal number -7 can be represented 4-bit signed binary as_____.
10. The decimal number system has a radix of_____.
11. The octal number system has a radix of_____.
12. A binary digit is called_____.
13. Convert the following binary numbers into 16. Express the following decimal numbers into hexadecimal numbers.
14. For shifting a 16-bit binary number into a l6 flip-flop serial shift register how many clock pulses will be required_____.
15. How many clock pulses are required to parallel load four-bits in the 74194 IC register_____.

16. A 4-bit shift register is to be made using D flip-flops. How many flip-flops will be required?
17. How many clock pulses are required to parallel load four-bits in the 74194 IC register?
18. Under what conditions the output of a two input OR gate is 0?

Q2. (1.5 Marks)

1. What is an IC ? Give its advangates.
2. Give the classification of integrated circuits.
3. What are the drawbacks of integrated circuits.
4. Classify ICs according to method of fabrication.
5. What are linear and digital ICs ?
6. Explain how different components are isolaed in manufacture of an IC.
7. State associative laws of Boolean algebra.
8. State De Morgan's theorems.
9. State OR, AND and NOT laws.
10. What is a Boolean algebra ?
11. How Boolean algebra differs from binary number systems.
12. What is a register ?
13. What is a shift register ?
14. What clock pulse does in a shift register ?
15. What is a counter?

16. What are the types of counters?
17. What is propagation delay in an asynchronous counter?
18. What is a ring counter?
19. What is a BCD decade counter?
20. Name the three groups of lines that connect the CPU and internal memory.
21. Out of address bus and data bus, which bus is bidirectional.
22. What is RAM?
23. What is ROM ?
24. What is memory interfacing ?
25. What is memory addressing ?

Q2. (2.5 Marks)

1. Explain how different components are isolaed in manufacture of an IC.
2. Give the various classification of ICs according to their size.
3. What is a wafer and a chip.
4. How epitaxial growth is obtained while manufacturing an IC.
5. Write a short note on octal number system.
6. What is advantage of octal number system over binary number system?
7. Distinguish between analog signal and digital signal.
8. How is octal system different from hexadecimal system.
9. Write the truth table of XOR and NXOR gate ? Mark the difference.
10. Draw the circuit diagram of NOT gate.
11. Draw the diode circuit of AND gate.
12. What is Boolean algebra ?
13. Draw the transistor AND gate circuit.
14. Construct a 4-variable Karnaugh map.

15. What are maxterms and minterms. Distinguish between them.
16. What do you mean by standard and non-standard form of expression.
17. Write a short note on SOP and POS.
18. What is rolling and overlapping in K-map.
19. Write an expression for electrostatic deflection sensitivity Write an expression for magnetic deflection sensitivity.
20. What is the necessity of time base voltage?
21. Trace the saw tooth voltage we produce in a neon tine.
22. Mention age neon time base eire four uses of a cathode ray oscilloscope.
23. How many flip flops will be needed to wire a 8 bit-serial in serial out register.
24. With a 100 KHz clock frequency, eight bits can be serially entered into a shift register in how much time.
25. What is a BCD decade counter?
26. Why ripple counter is called so?
27. Mention two applications of a counter.
28. Differentiate between various types of counters.
29. What is memory addressing ?
30. What is the function of read and write control lines in a microcomputer ?
31. What is a memory map ?
32. What is a binary cell ?
33. What is a 3-bit register?

Q4. (5 Marks)

1) What is an AND gate? Give the electrical circuit for AND operation. How AND gate can be realized from junction diodes? Explain the operation of AND gate and write its truth table.

2) What is an OR gate? Give the electrical operation for OR gate? How OR gate can be realized from junction diodes? Explain the operation of OR gate and write its truth table.

3) What is an NOT gate? Give the electrical operation for NOT gate? How NOT gate can be realized from a transistor? Explain the operation of NOT gate and write its truth table.

4) With a neat diagram explain how XOR gate is produce from OR,NAND and AND gates. Give the logic symbol and truth table and discuss about its operations. Write the Boolean expression for XOR operation.

5) With a neat diagram explain how XOR gate and NOT gate are used to obtain XNOR gate. Give the logic symbol and truth table for XNOR gate and discuss about its operations. Write the Boolean expression for XNOR operation.

6) With a neat logic symbol explain the operation of NAND gate.

7) With a neat logic symbol explain the operation of NOR gate.

8) Draw the block diagram of a CRO and indicate its components. Explain briefly the function of each component.

9) Describe the construction and working of a cathode ray tube.

10) What do you mean by sweep time and return time? Explain graphically the waveform of saw tooth voltage generated by time-base generator.

11) Explain the operation of 8 to 3 line encoder along with its logic circuit diagram and truth table.

12) With the help of logic diagram and truth table explain the working of a decimal to BCD encoder.

13) What is a decoder? Explain in details about the operation of a 3-to-8 line decoder.

14) How can a half adder be realized by using XOR gate, AND gate and OR gate?

15) How can a half subtractor be realized by using XOR gate and AND gate and OR gate?

16) With the help of logic circuit explain the working of a 4-bit binary adder.

17) With the help of logic circuit explain the working of a 4-bit binary subtractor.

18) With the help of logic circuit explain the working of a 4-bit binary adder-subtractor.

19) Under which condition it act as an adder? How can it be used as a subtractor.

20) Draw the block diagram of an IC-555 timer and describe the functions of all the pins of IC-555 timer.

21) Discuss the application of IC-555 timer as an astable multivibrator.

22) Discuss the application of IC-555 timer as a monostable multivibrator.

23) Draw the block diagram of a digital computer. Explain the functions of different units of a digital computer.

24) What is random access memory? Draw the logic diagram of a 1-bit RAM and explain its working

25) What is read only memory? Draw the block diagram of ROM and explain its working. How can a ROM be realized from decoder to encoder combination.

26) What do you mean by PROM, EROM and EEPROM?

27) Write notes on: (a)DVD-ROM (b)DVD-R (c)DVD-RW

28) Explain the working of a parallel-in-parallel-out shift register by drawing its logic diagram.

29) Explain the working of a parallel-in-serial-out shift register by drawing its logic diagram.

30) Explain the working of a serial-in-serial-out shift register by drawing its logic diagram.

31) Draw the logic diagram of a 4-bit synchronomous up counter and explain its working in details.

32) Draw the logic diagram of a 4-bit synchronomous down counter and explain its working in details.

33) Draw the logic diagram of a 4-bit asynchronomous up counter and explain its working in details.

34) Draw the logic diagram of a 4-bit asynchronomous down counter and explain its working in details.

35) What is twisted ring counter? With a neat logic diagram explain the working of a twisted ring counter.

36) What is ring counter? With a neat logic diagram explain the working of a4-bit ring counter.

37) Draw the circuit diagram of a master slave JK flip-flop. Explain its working and write the truth table.

38) How is an SR flip-flop converted into a D-flip-flop? Explain its operation and write the truth table.

39) How is a JK flip-flop converted into a T-flip-flop? Explain its operation andwrite the truth table.

40) How is an JK flip-flop converted into a D-flip-flop? Explain its operation and write the truth table.

1) How is an SR flip-flop converted into a JK-flip-flop? Explain its operation and write the truth table.
2) Draw the circuit diagram of a clocked SR flip-flop. Explain its working and write the truth table.
3) Draw the functional block diagram of an 8085 microprocessor and describe the functions of its various components.

4) What is memory? Explain in details about memory organization and addressing.
5) Explain input/output devices with suitable examples.