

No. of Printed Pages : 4
Roll No.

220832/212832

3rd Sem /
Branch : Computer, ECE, Automation & Robotics
Sub.: Digital Electronics

Time : 3Hrs.

M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

- Q.1 Which digital gate performs the multiplication operation? (CO2)
a) AND gate b) OR gate
c) NOR gate d) NAND gate
- Q.2 A decade counter counts _____ number of clocks. (CO3)
a) 4 b) 8
c) 10 d) 16
- Q.3 One byte is equals to _____ bits. (CO1)
a) 6 b) 8
c) 5 d) 7
- Q.4 A four variable K-Map has _____ cells. (CO2)
a) 4 b) 16
c) 8 d) 10

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- Q.5 The base of radix represents _____. (CO1)
a) No. of bits b) No. of digits
c) No. Of symbols d) All of above
- Q.6 The universal gate is _____. (CO2)
a) NAND gate b) OR gate
c) AND gate d) None of above

SECTION-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

- Q.7 How many NOR gates are required to obtain AND operation? (CO2)
- Q.8 PROM stands for _____. (CO5)
- Q.9 In Boolean Algebra, $(A \cdot \bar{A}) + A = ?$ (CO2)
- Q.10 2's complement of 100101 is _____. (CO1)
- Q.11 A flip flop has _____ stable states. (CO4)
- Q.12 Gray code equivalent to binary code 1011 is _____. (Co1)

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

- Q.13 Differentiate between weighted and non - weighted codes. (CO1)

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- Q.14 Convert $(67)_{10} = (?)_2 = (?)_8 = (?)_{16}$. (CO1)
- Q.15 Explain AND, OR and NOT gate with symbol and truth table. (CO2)
- Q.16 Solve the Boolean expression $\bar{A}B\bar{C} + \bar{A}\bar{B}C + \bar{A}BC + \bar{A}\bar{B}\bar{C}$. (CO2)
- Q.17 Give the basic function of MUX. Draw block diagram and truth table of 8x1 MUX. (CO3)
- Q.18 Explain 4 bit full adder circuit with diagram. (CO3)
- Q.19 Explain with diagram D flip flop. (CO4)
- Q.20 Explain with diagram SISO shift register. (CO4)
- Q.21 Explain Successive Approximation ADC. (CO5)
- Q.22 Explain classification of Semiconductor Memories. (CO5)

SECTION-D

- Note:** Long answer type questions. Attempt any two questions out of three questions. (2x8=16)
- Q.23 Simplify K-Map and realize the circuit with NAND gates only. (CO2)
- $Y = \sum m(0, 1, 3, 5, 7, 9, 11, 13, 15)$
- Q.24 Explain with diagram working of Synchronous Decade Counter. (CO4)
- Q.25 Define Encoder. Explain its function using block diagram. (CO3)

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**3rd Sem / Computer, ECE, Automation & Robotics,
Computer (For Speech and Hearing Impaired), ECE
(For Speech and Hearing Impaired)**

Subject : Digital Electronics

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SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

- Q.1 Which number system has a base 16. (CO1)
a) Hexadecimal c) Binary
b) Octal d) Decimal
- Q.2 A digital circuit that can store only one bit is a : (CO2)
a) Register c) Flip Flop
b) NOR Gate d) XOR Gate
- Q.3 2's Complement of 1011011 is: (CO1)
a) 0100011 c) 0100011
b) 0110101 d) 0100101
- Q.4 In the toggle Mode, a JK Flip Flop has: (CO4)
a) $J=0, K=1$ c) $J=0, K=0$
b) $J=1, K=1$ d) $J=1, K=0$

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- Q.5 De Morgan's law states that: (CO2)
a) $(A+B)' = A'+B$ c) $(AB)' = A'+B$
b) $(AB)' A'+B'$ d) $(AB)' = A+B$
- Q.6 The logical sum of two or more than two logical products is terminal as: (CO2)
a) OR Operation c) SOP
b) POS d) NAND Operation

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

- Q.7 $(13)_{10} = (\quad)_2$ (CO1)
a) 1101 b) 1110
c) 1100 d) 1111
- Q.8 The BCD code for decimal number 67 is: (CO1)
a) 01101001 b) 01010111
c) 01010110 d) 01100111
- Q.9 Which gate is known as universal gate? (CO2)
a) AND b) OR
c) NAND d) NOR
- Q.10 In a Boolean Algebra $X+1 = \underline{\quad}$ (CO2)
a) 0 b) 1
c) X d) None

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Q.11 A 8:1 MUX has _____ select lines. (CO3)

- a) 8 b) 4
- c) 3 d) 2

Q.12 Which material is used in the construction of LED (CO5)

- a) Silicon b) Gallium phosphide
- c) Germanium d) None

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Subtract (CO2)

- a) $(0101)_2$ from $(1011)_2$
- b) $(0011)_2$ From $(1000)_2$

Q.14 Write a short note on logic families. (CO2)

Q.15 Prove by using truth tables. (Co2)

- a) $A(B+C) = AB+AC$
- b) $A(BC) = (AB)C$

Q.16 What are the differences between sequential circuit and combinational circuit. (CO4)

Q.17 Realize the expression using a multiplexer. (Co3)

$$F(A,B,C,D) = \sum M(0,1,5,9,14)$$

Q.18 What are the advantages of LED over LED display devices? (CO5)

Q.19 Explain how JK flip-flop can work as T flip flop. (CO4)

Q.20 Explain the working of 3 bit synchronous counter. (CO4)

Q.21 What are the differences between static Memory and Dynamic Memory? (CO5)

Q.22 Draw and explain pulsed operation of 3 input AND gate. (CO3)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Example with diagram with working of BIT synchronous counters. (CO4)

Q.24 Explain the working of PIPO shift register with the help of pulse wave diagram and truth table. (CO4)

Q.25 Reduce the following Boolean expression by using K-map and realize the reduced Expression by using NAND gates only.

$$Y = \sum M(1,3,7,11,15) + \sum d(0,2,5) \quad (\text{CO2})$$

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ECE (For Speech and Hearing Impaired)
Subject : Digital Electronics**

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M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

- Q.1 A half adder consists of _____ CO-3
a) 1 Input 1 Output b) 1 Input 2 Output
c) 2 Input 2 Output d) 2 Input 1 Output
- Q.2 The number of select lines for 8:1 MUX are _____ CO-3
a) 6 b) 4
c) 2 d) 3
- Q.3 One byte is equals to _____ nibble. CO-1
a) 1 b) 2
c) 3 d) 4
- Q.4 Latches are _____ circuit. CO-4
a) Edge triggered b) Pulse triggered
c) Count triggered d) Level triggered

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Q.5 The binary equivalent of decimal number 5 is

CO-1

- _____
- a) 101 b) 100
c) 001 d) 111

Q.6 Which of the following combination is not allowed in SR flip-flop. CO-4

- a) S=1, R=1 b) S=0, R=1
c) S=1, R=0 d) S=0, R=0

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

- Q.7 _____ flip-flop doesn't have race around condition? CO-4
- Q.8 EPROM stands for _____. CO-5
- Q.9 Convert $(9FDA)_{16}$ into binary equivalent. CO-1
- Q.10 Name the Boolean law : $A+B= B+A$ CO-2
- Q.11 BCD code for decimal number 67 is _____ CO-1
- Q.12 The output of multiplexer depends upon _____ CO-3

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SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Differentiate between analog and digital signal.
CO-1

Q.14 a) Subtract 24 from 16 using 2's complement method.
CO-1

b) Convert $(64.5)_8$ into binary.

Q.15 Explain NAND gate as Universal gate. CO-2

Q.16 Solve the Boolean expression : $\overline{X}\overline{Y} + \overline{X}\overline{Z} + \overline{X}\overline{Y}\overline{Z}$.
CO-2

Q.17 Explain half adder with circuit diagram. CO-3

Q.18 Explain with circuit diagram 1:4 DEMUX. CO-3

Q.19 Explain in detail about Ring Counter with diagram.
CO-4

Q.20 Differentiate between Static and Dynamic RAM.
CO-5

Q.21 Explain R/2R Ladder DAC. CO-5

Q.22 Explain SR flip-flop with diagram. CO-4

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SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Simply K-map and realize the circuit with NAND gates only CO-2

$$Y = \sum m(0,1,2,5,7,13,14) + d(3,6,9).$$

Q.24 Explain

a) Postulates of Boolean algebra. CO-2

b) EPROM CO-5

Q.25 Explain 7-segment display decoder with diagram.
CO-3

(**Note:** Course outcome/CO is for office use only)

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**3rd Sem / Comp., ECE, Automation & Robotics,
Comp. (For Speech & Hearing Impaired)**

Subject:- Digital Electronics

Time : 3Hrs.

M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 The universal gate is _____

- a) NAND b) OR
- c) AND d) NOT

Q.2 In 8:1 MUX, How many select lines are required ?

- a) 4 b) 3
- c) 2 d) 1

Q.3 If $J=0$ and $K=1$ then the output $Q=$ _____.

- a) 1 b) 0
- c) non change d) Toggle

Q.4 The full form of ALU is _____

- a) Adder Logic Unit
- b) Add Loop Unit
- c) Arithmetic Logic Unit
- d) None of the above

Q.5 The binary equivalent of decimal number 5 is _____

- a) 101 b) 100
- c) 001 d) 111

Q.6 If $A=0$ and $B=0$ then $A.B=$ _____

- a) 0 b) 1
- c) 10 d) 11

SECTION-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 State De-Morgan's Theorem.

Q.8 $X+XY=$ _____

Q.9 _____ flip-flop doesn't have race around condition.

Q.10 BCD code for decimal number 67 is _____

Q.11 Expand CMOS.

Q.12 Draw the symbol of EX-OR Gate.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Convert $(6A8C)_{16}$ into binary number.

Q.14 Define NAND Gate. Also draw symbol and truth table of NAND Gate.

Q.15 What is race around condition in J-K flip-flop.

Q.16 Explain full adder with circuit diagram.

Q.17 Subtract the $(10011)_2$ from $(11001)_2$ using 2's complement method.

Q.18 Write any four differences between Static RAM and Dynamic RAM.

Q.19 List various application of A/D converter.

Q.20 Explain Half Adder with diagram.

Q.21 Simplify: $ABC + \bar{A}BC + A\bar{B}C + AC$

Q.22 Differentiate between Asynchronous and Synchronous Counters.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Minimize the following Boolean expression using K-map and realize the logic circuit using NAND gates only.

$$F(A,B,C,D) = \sum m(1,3,5,7,9,15) + d(4,6,12,13)$$

Q.24 Explain 8:1 MUX with truth table and diagram.

Q.25 Explain BCD to 7 segment decoder.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Simplify K-map and realize the circuit with NAND Gates only

$$Y = \sum m(0, 4, 8, 9, 12, 13)$$

Q.24 Explain Master Slave J-K Flip-flop in detail.

Q.25 Write short note on any two of the following:

- Ring counter
- Dynamic RAM
- D- flip flop

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**3rd Sem / Computer, ECE, Automation & Robotics,
Computer (For Speech and Hearing Impaired), ECE
(For Speech and Hearing Impaired), IT, Eltx, EI, Med.
Eltx., Power Eltx, Elect. & Eltx. Engg.**

**Subject : Digital Electronics / Digital Eltx. -I / Digital
Electronics & Computer Architecture**

Time : 3 Hrs.

M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 Base /Radix of Hexadecimal number system is _____.

- a) 10 b) 8
c) 2 d) 16

Q.2 The NAND gate is AND gate followed by

- a) NOT Gate b) OR Gate
- c) NOR Gate d) EXOR Gate

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Q.3 In Boolean algebra, $X+X=$ _____

- a) 0 b) 1
- c) X d) 2X

Q.4 A 4 variable k-map has _____ cells.

- a) 9 b) 16
- c) 8 d) 3

Q.5 The binary number 11001 is equivalent to decimal number

- a) 25 b) 24
- c) 27 d) 26

Q.6 One Byte equals to _____ bits.

- a) 2 b) 4
- c) 1 d) 8

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Convert decimal number $(39)_{10}$ into binary number.

Q.8 Write full form of EPROM.

Q.9 1's complement of 11001000 is _____.

Q.10 Draw symbol of NAND gate.

Q.11 Latches are _____ (Edge Triggered / Level Triggered)

Q.12 _____ gate is called as inverter.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Differentiate between Analog signal and Digital signal.

Q.14 Explain NAND Gate as universal gate.

Q.15 Solve the Boolean expression:

$$XY + XZ + XYZ$$

Q.16 Explain J-K flip flop with diagram

Q.17 Convert $(72)_{10} = (?)_2 = (?)_8$.

Q.18 Explain any one type of Encoder.

Q.19 Explain Full Adder with diagram.

Q.20 Explain R/2R D/A converter.

Q.21 Differentiate between latch and flip-flop.

Q.22 Explain 8:1 multiplexer.