KHAIRA COLLEGE, KHAIRA, BALASORE

QUESTION BANK
UG 4th Sem - CC – X

Answer all questions

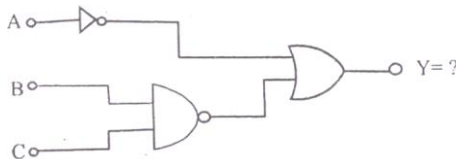**1- Answer the following :**   **[1mark]**

a) Circuit symbol of NAND gate is _____.

b) _____ is an integrated circuit that contain all the components like capacitors, resistors transistors.

c) Boolean expression for 3 input OR gate is _____ .

d) $(35)_8$ = (_____)$_{10}$.

e) Draw circuit symbol of "XNOR" gate .

f) RAM is _____ .

g) _____ is known as sweep generator.

h) A multiplexer is also known as a dataselector. (True/ false)

i) Which component increases the power of a signal.

j) The binary equivalent of $(0.75)_{10}$ is _____ .

k) n-binary literals can be combined with an AND operation in _____ possible ways.

l) Karnaugh Map is a _____ method used to simplify Boolean expressions containing two or four variables.

m) The 1's complement of 11011001 is _____ .

n) Write the expression for differential d at the output of a half substractor.

o) The heart of all digital circuits is _____ .

p) 1 byte = _____ bits.

2- Answer the following (Very short type) :-   **[1.5 marks]**

   a) Write three applications of Ic's .

   b) What is a water? Write it's uses.

   c) Convert $(437)_8$ to decimal.

   d) Simplify the expression using De-Morgan's theorem

      $Y = [(A+B') - (B+C')]$

   e) Find out the decimal equivalent of minterm ABC'.

   f) What is a transducer?

   g) Add the binary numbers $(101.11)_2$ and $(110.01)_2$.

   h) Substract 100 from 111 by is complement method.

   i) Define decoder.

   j) Name different units of a digital computer.

   k) Define active component with example.

   l) Convert $(0.135)_{10}$ to binary.

   m) Convert $(3A5)_{16}$ to octal.

   n) Define ring counter.

   o) Define XNOR Gate.

   p) Draw AND Gate circuit diagram using diode.

   q) Prove that $(A.B)' = A'+B'$.

   r) Define decoders.

   s) Write output of given circuit.

   t) Define optical memory

3- Answer the following (Sort type) :-   **[2 marks]**
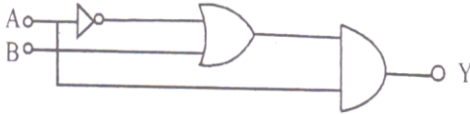
a) Explain scale of Integration.

b) Write truth table of 'XOR' Gate.

c) Write truth table of 3 input NOR Gate.

d) Explain pairty checker.

e) Simplify the Boolean expression.

Y = AB + A(B+C) + B(B+C)

f) What is voltage of sinusoidal wave measured in CRO?

g) Using Boolean algebra simplify the following logic circuits

h) What is full adder? Draw its symbolic diagram.

i) Define an encoder. Draw symbolic diagram of M to N line encoder.

j) Describe about control unit of a digital computer.

k) Draw circuit diagram for two input diode or gate.

l) Describe how NOT gate can be obtained from NAND gate.

m) State duality principle.

n) Simplify the expression – Y = AB+B(A+B)+C(B+C).

o) Explain sum of product and product of sum.

p) Draw block diagram of CRO.

q) Distinguish between multiplexer and de-multiplexer.

r) Write the application of encoder.

s) Substract $(1011)_2$ from $(1001)_2$ by 2's complement method.

t) Describe about control unit of a digital computer.

4. **Answer the followings (Long type) :-**   **[6marks]**

   a) Define Integrated circuit. Write down the advantages and disadvantages of integrated circuit.

   b) What is NAND gate? Write the truth table and logic symbol. Explain how NAND gate can be realized using diodes and transistors.

   c) State and prove De Morgan's theorem.

   d) Describe the construction of CRO with diagram. Find expression for electrostatic deflection.

   e) Describe a full adder with logic circuit.

f) What is IC – 555 timer. Describe 8-pins IC-555 timer with block diagram.
g) Explain data storage giving brief description of RAM and ROM.
h) Describe ring counter with logic diagram using D – flip-flops.
i) Describe classification of integrated circuit.
j) Define OR gate. Write truth table. Draw logic symbol. Describe its operation drawing the circuit diagram for a two input or gate using diode.
k) Simplify the function $F = \bar{A}B + \bar{B}C + BC + A\bar{B}C$ using Karnugh map.
l) Describe the working of cathode ray tube with neat diagram.
m) What is multiplexer? Explain an 4 to 1 multiplexer with necessary truth table and logic circuit.
n) Describe about half and full substractor.
o) What is a shift register? Discuss about serial in serial out shift register.
p) Discuss about a 4 bit synchronous decode counter.

★ ★ ★ ★ ★ ★ ★ ★