Total No. of Printed Pages:2

SUBJECT CODE NO:- H-433
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (CSE/IT)
Digital Electronics
(REVISED)

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
1. Q.1 and Q.6 are compulsory.
2. Solve any two questions from Q.2 to Q.5 and any two questions from Q.7 to Q.10.

Section A

Q.1 Solve any five questions: 10

a) State and prove De-Morgan's theorem.

b) Represent $(-33)_{10}$ in
   i) Sign Magnitude
   ii) One's complement

c) Convert following-
   i) $(9\,AC.FA)_{16} = (?)_8$
   ii) $(19.625)_{10} = (?)_2$

d) Design a 4 i/p NAND gate by using 2 i/p NAND gates only.

e) What is mean by self-complementing codes?

f) Reduce following using k map.
$F(A,B,C) = \sum m\,(1,2,3,7)$

g) Perform following binary arithmetic operations
   i) $(111\,0101)/\,(1001)$
   ii) $(1001) * (1101)$

h) Realize the following expression using logic gates
$Y = (\overline{A}.\overline{B}.\overline{C}) + (A \oplus B) + (A.C)$

Q.2 a) Implement 3 input NAND gate using TTL logic. 07

b) Differentiate between analog signal and digital signal. 08

Q.3 a) Define weighted codes, excess-3 code, BCD and define gray code. Explain with example. 07

b) Use NOR gate to produce AND, OR, NOT, NAND, X-OR and X-NOR gates. 08

Q.4	a)	Design binary to gray code converter.	07
	b)	What is digital signal? Explain its different characteristics.	08
Q.5	a)	Design a BCD to 7 segment decoder.	07
	b)	Design a 4 bit adder with look ahead carry.	08

Section B

Q.6 Solve any five questions: 10

a) What is Demultiplexer? Explain with any one example.
b) Explain Decimal to BCD Encoder.
c) What is PROM?
d) What is the logic symbol and truth table of T F/F?
e) Compare combinational and sequential circuits.
f) Draw logic diagram for 4 bit PIPO shift reg.
g) Draw 3 bit asynchronous counter.
h) Write excitation table of SR F/F.

Q.7	a)	Design and implement circuit for 2 bit comparator using 4 line to 16 line decoder and multi input OR gates.	08
	b)	Draw and explain NAND implementation of 1 bit memory cell.	07
Q.8	a)	Design 16:1 multiplexer using two 8:1 multiplexer and logic gates. Explain working.	08
	b)	Draw logic diagram of 4 bit SISO right shift register. Explain it.	07
Q.9	a)	Convert i) SR F/F to JK F/F. ii) D type F/F to JK F/F	08
	b)	Design and explain MOD-10 ripple counter.	07
Q.10	a)	Explain designing of n bit comparator using IC.	08
	b)	Explain working of 4 bit universal shift register.	07