

(Please write your Exam Roll No.)

Exam Roll No. ....

## END TERM EXAMINATION

FIRST SEMESTER [MCA] DECEMBER-2009

Paper Code: MCA103 Paner Id-44103	Subject: Digital Electronics
Time : 3 Hours	Maximum Marks: 60
Note: Q.1 is compulsory. Attempt one question from each unit.	

- Q1 Answer the following questions:- (2x10=20)
- (a) Convert 111011 into hexadecimal through octal.
  - (b) What are the advantages of Gray code?
  - (c) Write down fan-in and fan-out of standard TTL ICs.
  - (d) Represent the logic diagram of the half adder.
  - (e) What is the drawback of the SR Flip Flop and how is it minimized?
  - (f) What is a sequence generator?
  - (g) What is asynchronous sequential circuit?
  - (h) Draw a scale of 8 ripple counter.
  - (i) What do you mean by static and dynamic memories?
  - (j) How is an individual location in EEPROM erased or modified?

### UNIT-I

- Q2 (a) Prove the following by perfect induction method. (4)
- (i)  $A+AB=A$  (ii)  $A(A+B)=A$  (iii)  $A+A'B=A+B$  (iv)  $A(A'+B)=AB$
  - (b) Reduce the function  $f$  using K-map and realize it using NAND gates only. (6)

### OR

- Q3 (a) Minimize the function using Boolean algebra  $f = x(y+w'z) + wxz$ . (4)
- (b) Design a 2 input NAND gate using 2:1 multiplexer. (3)
  - (c) Draw the logic diagram of 4-bit universal shift register. (3)

### UNIT-II

- Q4 Design synchronous counter that counts in the sequence 0,2,6,1,7,5 and 0 using D-FFs. Draw the logic diagram and state diagram. (10)

### OR

- Q5 Draw the circuit diagrams of 2 input CMOS NOR gate and CMOS NANA gate using CMOS logic and explain their operation. (10)

### UNIT-III

- Q6 (a) Write short notes on races and cycles that occur in fundamental circuits. (3)
- (b) What is an essential hazards? Explain with example. (3)
  - (c) Explain how hazard free realization can be obtained for a Boolean function? (4)

### OR

- Q7 Draw an asynchronous decade counter and explain its operation by drawing waveforms. (10)

### UNIT-IV

- Q8 Explain Instruction cycle and Interrupt cycle with the help of flowchart. Describe instruction format and addressing mode bits. (10)

### OR

- Q9 A microprocessor multiplexes data from four different data terminals and sends the multiplexed data over a telephone link to a remote unit, via a UART. Suggest the most suitable I/O communication scheme (such as parallel, serial, synchronous, asynchronous, strobed, handshaked) between :- (10)

- (a) The data terminals and the microprocessor
- (b) The microprocessor and the UART
- (c) The UART and the remote unit.

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