[Total No. of Questions - 9] [Total No. of P... ted Pages - 2]
(2066)

16051(J)

B. Tech 4th Semester Examination

Electronic Device Modelling (NS)

EC-223

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one question each from Sections A, B, C and D. Section E is compulsory. Use of non-programmable calculators is allowed.

SECTION - A

1. Discuss the source of diode resistance and junction capacitance. Explain the working of transistor and it's application as a switch. (20)

2. Explain construction, operating principle, working and applications of JFETs. Compare n-channel and p-channel JFETs. (20)

SECTION - B

3. Explain the working of monostable multivibrator and design it to generate a pulsed signal of pulse width 5 msec. (20)

4. (a) Write a note on digital light processing technology.

   (b) Compare LED, LCD and OLED. (20)

SECTION - C

5. (a) Design a BCD to binary converter using a ROM.

   (b) Design a combinational circuit with four inputs and four outputs. The output generates the 2's complement of the input binary number. (20)

[P.T.O.]

6. Reduce the number of states in the following table and tabulate the reduce state table. Starting from state a, find the output sequence generated for an input sequence 01110010011.

Present state	Next state		Output	
a	e	b	0	0
b	d	c	1	0
c	f	e	0	1
d	g	a	1	0
e	d	c	0	0
f	f	d	1	1
g	g	h	0	1
h	g	a	1	0

(20)

SECTION - D

7. (a) Design a ripple counter with four shift registers.

   (b) Discuss the terms set up time, hold time, clock skew. (20)

8. (a) Find a circuit which has no static hazards and implements the Boolean function:
   $F(A, B, C, D) = \Sigma(0, 2, 3, 6, 7, 8, 10, 12)$

   (b) What are the hazards in combinational circuits and sequential circuits? Explain giving suitable example. (20)

SECTION - E

9. (i) State Law of Mass Action.
   (ii) What is the importance of a.c. load line?
   (iii) What is the working principle of LED?
   (iv) What is the working principle of electronic ink displays?
   (v) Give any two applications of photo sensors.
   (vi) Reduce using K-map $F(A, B, C)=\Sigma(0, 2, 4, 5, 6, 7)$.
   (vii) What is the need of biasing? Discuss any biasing scheme.
   (viii) Give the operating principle of UJT.
   (ix) Distinguish PLA based design from PAL based design.
   (x) What do you mean by thermal runaway? (10×2=20)