B.E. (Electrical Engineering (Electronics & Power)) Fourth Semester (C.B.S.)

Digital & Linear Electronics Circuits

P. Pages : 2 **NJR/KS/18/4420**

Time : Three Hours Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Explain in detail the working of a two i/p TTL NAND gate with totem pole output. **6**

b) Use k-MAP to solve the following. **8**

i) $f(A,B,C,D)=\Sigma m\,(0,1,4,6,7,11,12,13,15)+d(3,10)$

ii) $F(A,B,C,D)=\pi M\,(1,4,8,10,12,13,15)\cdot D(2,11)$

OR

2. a) Implement the following functions using 1×8 DEMUX and suitable gate : **6**

$F_1(A, B, C)=\Sigma m\ (0, 2, 4, 7)$

$F_2(A, B, C)=\Sigma m\ (1, 2, 5, 6)$

b) Design a circuit to convert BCD code to Excess-3 code. Implement using only NAND gates. **8**

3. a) Explain one bit memory cell. **7**

b) Convert SR Flip-Flop into D-type flip-flop. **6**

OR

4. a) Convert **6**

i) S-R flip flop to J-K flip flop

ii) T flip flop to D flip flop.

b) Explain the working of master slave J-K flip-flop and explain how race around condition can be eliminated. **7**

5. a) Design full adder using two half adder and OR-gate & explain it. **6**

b) Draw and explain 4-bit Ripple counter with waveforms. **7**

OR

6.	a)	Design MOD-6 Counter using flip-flop.	**6**
	b)	Explain in detail Arithmetic logical unit with neat diagram.	**7**
7.	a)	Draw the block diagram of op-Amp & explain the function of each block.	**6**
	b)	Explain Practical Integrator circuit with suitable circuit diagram.	**7**

OR

8.	a)	Draw and explain the commonly used three op-amp instrumentation amplifier circuit. Derive expression for its gain.	**6**
	b)	Realize the circuit using op-amp for the equation. $V_0 = 3V_1 - 2V_2 + V_3 - 2V_4$	**7**
9.	a)	Explain R-2R ladder type D to A converter.	**7**
	b)	Explain Schmitt trigger using op-amp.	**7**

OR

10.	a)	Explain the circuit of positive clipper and negative clipper.	**7**
	b)	Design a second order active low pass Butterworth filter for cut off frequency of 2kHz.	**7**
11.	a)	Draw the internal block diagram of IC 555 and explain its working.	**7**
	b)	Write a short note on IC LM 339.	**6**

OR

12.	a)	Design astable multivibrator using IC 555 having output frequency of 10 kHz and duty cycle is 50%.	**7**
	b)	Write short notes on IC 723 voltage Regulator.	**6**

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