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

Digital & Linear Electronics Circuits Paper - III

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Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Which is the fastest logic family? Why and explain CMOS NAND gate? **7**

b) Prove the following using Boolean algebra. **6**

i) $AB + \overline{A}B + \overline{A}\,\overline{B} = \overline{A} + B$

ii) $A + \overline{A}B + A\overline{B} = A + B$

OR

2. a) Design 3 bit Binary to Gray code converter using EXOR gate. **6**

b) Simplify the following logic functions and realize using minimum number of NAND gates. **7**
$f(A, B, C, D) = \pi m (1, 2, 3, 8, 9, 10, 11, 14) + d (7, 15)$.

3. a) What is meant by race around condition? Explain the working of Master slave J-K Flip Flop. **8**

b) What is Random Access memory? Explain different types of RAM. **6**

OR

4. a) Convert.

i) S-R flip flop to D flip flop. **8**

ii) J-K flip flop to T flip flop.

b) Explain in detail the use of preset and clear terminal of flip flop. **6**

5. a) Design MOD-6 counter using flip-flop. **7**

b) Design full subtractor using two half subtractors. **6**

OR

6. a) Design 3 bit ripple up counter. **6**

	b)	Explain in detail Arithmetic logical unit with neat and clean diagram.	**7**
7.	a)	Explain practical Integrator circuit with suitable circuit diagram?	**8**
	b)	Define the following with respect to op-amp.	**6**

b) Define the following with respect to op-amp.
i) SVRR   ii) Input bias current.
iii) Slew rate   iv) CMRR.

OR

8. a) Draw and explain the circuit of instrumentation amplifier using 3 Op-amp and derive the necessary expression. **7**

b) Realize the circuit using Op-Amp for the eq^n $V_0 = 3V_1 - 2V_2 + V_3 - 2V_4$. **7**

9. a) Draw and explain full wave precision rectifier using Op-amp. **6**

b) Explain R-2R ladder type D to A converter. **7**

OR

10. a) Design a second order active low pass Butterworth filter for cut off frequency of 2 KHz. **7**

b) Explain sample and Hold circuit using Op-Amp? **6**

11. a) Write a short note on IC LM 339. **6**

b) Design astable multivibrator using IC555 having output frequency of 10 KHz and duty cycle is 50%. **7**

OR

12. a) Draw the functional diagram of IC723 regulator and explain its operation. **7**

b) Design 12V regulator using 7812IC. **6**

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