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Roll No.....

IV SEMESTER

B.Tech.(CO/IT/SE)

END SEMESTER EXAMINATION *May-2019*

EC-262 DIGITAL ELECTRONICS

Time: 3:00 Hours *Max. Marks: 40*

Note : Answer all question by Selecting any two parts from each question.
All questions carry equal marks.
Assume suitable missing data, if any.

Q.1[a] Simplify the following function using Quine-McClusky method:
$Y = f(a,b,c,d) = \sum_m(0,2,3,5,8,10,11,13) + \sum_d(7,15)$.

[b] Reduce the following Boolean function using K-map and realize the simplified expression using NOR gates
$Y = f(a,b,c,d) = \sum_m(0,2,3,5,6,7,8,9) + \sum_d 10,11,12,13,14,15)$

[c] Implement a Full Subtractor from a Full Adder

Q.2[a] Fill the following table using fewest number of bits:

DECIMAL EQUIVALENT	SIGN MAGNITUDE	1's COMPLEMENT	2's COMPLEMENT
-27			
			10000
		10100	
	11011		
		011011011	

[b] Define and explain the following:
(i) Speed of operation (ii) Figure of merit
(iii) Noise Immunity (iv) Current and voltage parameters

[c] Explain the operation of TTL logic NAND gate in totem pole configuration also state its limitations.

Q.3[a] Design a Synchronous Mod 10 counter for down counting by using D Flip flop. How it can be converted to an Up counter?

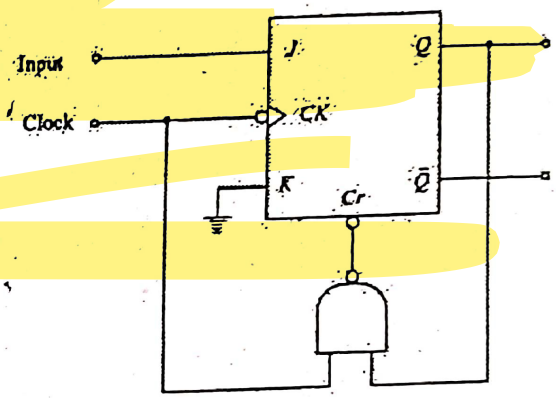
[b] Design a four bit universal shift register and discuss its all possible operations.

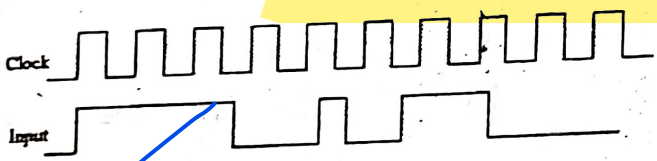
[c] What are ROM and RAM? State their use and also compare them.

Q.4[a] Explain with a neat circuit diagram the working of a bi-stable multivibrator using transistors and state its applications.

[b] Compare synchronous and asynchronous circuits.

[c] The input and the clock are applied to the circuit shown in Fig.1. Sketch the output waveforms at Q and $\bar{Q}$





Q.5[a] Explain the operation of the dual slope analog to digital convertor and derive an equation for the number of count recorded in the counter.

[b] Draw an ASM chart and the state table for a two bit up-down counter having mode control input.

[c] Discuss the working principle of a three bit R-2R ladder type DAC and derive the analog value of output for all possible digital inputs. Assume Vcc and R_f value suitably.

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