

S.Y.B.TECH ELECTRICAL

SUBJECT:-DIGITAL ELECTRONICS AND MICROPROCESSOR

FUNDAMENTALS (EE210)

End-Semester Examination-2012

Date:-14/05/2012

Day:-Monday

Max. Marks.-50

Time:-9.00 am to 12.00 noon

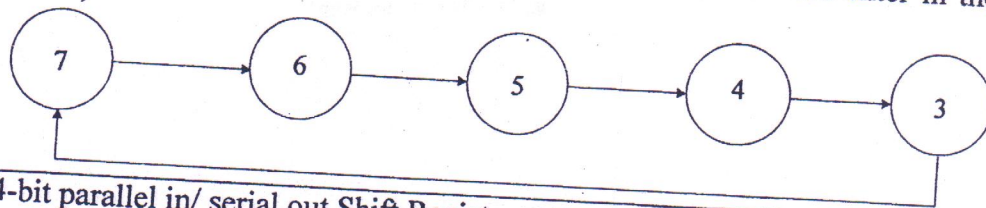
Instructions:-

1. **Solve any five questions.**
2. Assume necessary data whenever required.
3. Non programmable calculators are allowed.
4. **While writing answers maintain the sequence of questions.**
5. Draw neat diagram whenever required.

Q.N. 1		
(A)	Define the following characteristics of digital IC's (Any three) 1. Noise margin or Noise immunity 2. Fan in 3. Fan out 4. Speed of operation	03
(B)	In a certain number system X and Y are two successive digits. When written as XY, it is equal to $(25)_D$ and when written as YX, it is equal to $(31)_D$. Find the values of X and Y and the number system (Base of the number system).	03
(C)	A combinational circuit has three inputs A, B, and C and an output Y. Y is true only for the following combinations: (a) A is false and B is true. (b) A is false and C is true. (c) A, B and C are all false. (d) A, B and C are all true. (i). Write the truth table for Y. Use the conversion true=1 and false=0. (ii). Write the simplified expression for Y as a sum of products. (iii). Write the simplified expression for Y as a product of sums. (iv). Draw a logic circuit implementation of Y using the minimum number of 2-input NAND gates only.	05
	OR	
(C)	Simplify the following function using K-map 1. $f(w, x, y, z) = \sum(0,1,2,5,8,14) + d(4,10,13)$ 2. $f(A, B, C, D) = \prod M(4,6,10,12,13,15)$	05

Q.N. 2
(A)

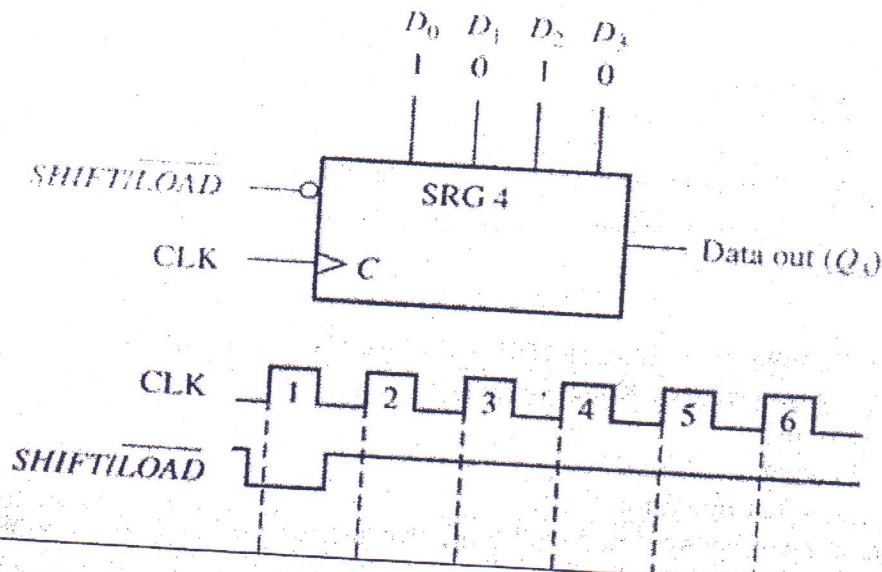
Design a lock free ripple counter using 'T' FLIP-FLOP which must go through the state diagram. (Whenever invalid state occur assume counter will enter in the first valid state)



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(B)

For 4-bit parallel in/ serial out Shift Register assuming initially output (Q_3) as 0, draw the output waveform



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Q.N. 3

- The logic levels used in an 8-bit R-2R ladder DAC are: $0=0V$ and $1=+5V$. What is the binary input when the analog output is 4 V?
- How many bits are required for a DAC, so that its full scale output is 12.6 V and resolution 20mV?
- The resolution of a 12-bit ADC is 10mV. What is its full-scale range?
- The frequency components of the analog input to an ADC range from 50 Hz to 50 kHz. What is the maximum total conversion time that the converter can have?
- An 8-bit SAC has a resolution of 15 mV. What will its digital output be for an analog input of 2.65 V?

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Q.N. 4

- A)** Explain the classification of memories according to their physical characteristics.
- B)** Explain the different type of RAM.

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- C)** Explain in short what working features you get from the following terms.

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- ROM.
- EPROM.
- EEPROM.
- PLA.
- CAM.

Q.N. 5

List and briefly describe the various components of the microprocessor.

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