B.E.(with Credits)-Regular-Semester 2012-Computer Technology / Information Technology Sem III CT305 / IT304 : Digital Circuits & Fundamentals of Microprocessors

Р. Ра Гіте	ges : 1 : Thre	2 ee Hours	GUG/W/16 * 3 6 0 6 * Max. Ma	5/ 3707 rks : 80
	Notes	s: 1. 2. 3. 4.	All questions carry marks indicated. Due credit will be given to neatness and adequate dimensions. Assume suitable data wherever necessary. Illustrate your answers wherever necessary with the help of neat sketches.	
ι.	a)	State an	d prove De-Morgan's theorem.	8
	b)	Reduce i) B ii) Al	the following Boolean expressions. $\overline{C}D + (\overline{B+C+D}) + \overline{B}\overline{C}\overline{D}E$ $\overline{A} + \overline{AC} + \overline{ABC} + \overline{ABC}$	8
			OR	
2.	a)	An air c time of followin i) Te ii) Th iii) Th be iv) It i Write a	conditioning unit is controlled by four variables : Temperature T, humidity H, the the day P and the day of the week W, The unit is turned on under any of the ng circumstances. mperature exceeds 78°F and the time of the day is between 8 a.m. and 5 p.m. e humidity exceeds 85%, the temperature exceeds 78°F, and it is a weekend. e humidity exceeds 85%, the temperature exceeds 78°F, and the time of day is tween 8 a.m. and 5 p.m. s Saturday or Sunday and humidity exceeds 85%. logic expression for controlling the air conditioning unit.	8
	b)	Make a	k-map of the following expression and obtain the minimal SOP and POS terms.	8
3.	a)	What is	MUX ? Write down the applications of MUX.	8
	b)	Implem	ent $F = (\overline{x} + \overline{y}) \cdot (x + \overline{z}) \cdot (\overline{x} + y + z)$ using MUX.	8
			OR	
4.	a)	In a che follows Pressure	mical plant the various parameters to be tested along with their priorities are as : e P - Highest	8

Viscosity V - Highest Height H - Lowest

Design a suitable priority encoder for the above situation.

- b) Differentiate between combinational and sequential circuits.
- a) What is SR flip flop ? Give the truth table for SR flip flop. Implement SR latch using NAND gates and explain working write the characteristic equation of SR flip flop.

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OR

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8

6.	a)	Design a mod-6 counter using JK flip flops with separate logic circuit for J and K. Check whether the counter is self starting or not.	8			
	b)	Distinguish between synchronous and asynchronous counter with its applications.	8			
7.	a)	Why AD7-AD0 lines of $\mu p \ 8085$ are multiplexed ? How these lines are demultiplexed ? Explain how $\overline{IOR} \ \overline{IOW} \ \overline{MRD}$ and \overline{MWR} signals are generated.	8			
	b)	Explain flag register of µp 8085.	8			
	OR					
8.	a)	Draw the timing diagram of OUT 40 H.	8			
	b)	Explain in detail the hardware interrupts of µp 8085.	8			
9.	a)	Draw and explain the format of SIM instruction in detail.	8			
	b)	Explain BSR mode of 8255 PPI and generate a square waveform of time period 2 msec on PC_0 pin.	8			
OR						
10.	a)	Explain different modes of 8253 programmable timer.	8			

b) Give the difference between memory mapped I/O and I/O mapped I/O.
