B. Tech Degree III Semester (Special Supplementary) Examination, August 2005

IT 304 ELECTRONIC CIRCUITS AND LOGIC DESIGN

(2002 Admissions onwards)

Time : 3 Hours Maximum Marks : 100

I.	(a)	Draw the small signal low frequency model of BJT and explain the significance of each parameter.	(10)
	(b)	Explain the amplification of CE transistor.	(4)
	(c)	Explain the principle of operation and characteristics of FET.	(6)
		OR	
II.	(a)	Draw and explain the working of a phase-shift oscillator. Write down the expressions for (i) frequency (ii) condition for sustaining oscillation.	(10)
	(b)	What are the advantages of negative feed back? Explain.	(4)
	(c)	Explain transformer coupled amplifier. Derive the expression for efficiency.	(6)
III.	(a)	Define A_c and A_d of a differential amplifier. Derive an expression for CMRR as a function of A_c and A_d.	(10)
	(b)	What are the characteristics of ideal op-amp?	(3)
	(c)	Explain the two level clipping circuits using diodes.	(7)
		OR	
IV.	(a)	What are the applications of op-amp?	(4)
	(b)	Explain the damping circuits.	(5)
	(c)	Draw a block diagram of op-amp. Explain the function of each stage. Define input offset voltage, input offset drift voltage and output offset voltage.	(11)
V.	(a)	Explain – (i) Positive and negative logic (ii) Grey code and Excess 3 code.	(4)
	(b)	Explain the full adder and half adder circuits.	(6)
	(c)	Explain with examples a binary division process.	(10)
		OR	
VI.	(a)	Use K-map to simplify the following expression – $f = \sum m(0,1,4,5,6,9,11,14,15) + d(10,12,13)$ Realize the simplified expression using NAND gates only.	(12)
	(b)	Explain the binary multiplication with examples.	(8)
VII.	(a)	Explain the interfacing of CMOS with TTL.	(8)
	(b)	Compare the characteristics of different logic families.	(4)
	(c)	What is a synchronous counter? Explain it with necessary diagram.	(8)
		OR	
VIII.	(a)	Draw the logic diagram, truth table and waveforms for the synchronous counter in the count-up-mode.	(12)
	(b)	Write a note on (i) Propagation delay (ii) Noise margin.	(4)
	(c)	What advantage does a JK flip flop have over an R.S flip flop.	(4)
IX.	(a)	Write short notes on : (i) MOSRAMS (ii) Demultiplexer.	(8)
	(b)	Differentiate between PLA and PAL devices.	(12)
		OR	
X.	(a)	Explain with necessary diagrams – (i) Multiplexer (ii) Demultiplexer.	(10)
	(b)	Write notes on : (i) EPROM (ii) BJTRAM CELLS (iii) MOSRAMS.	(10)

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