B.Tech Degree V Semester (Supplementary) Examination in Electronics & Communication Engineering, July 2003

EC 503 MICRO ELECTRONICS AND INTEGRATED CIRCUITS

(1998 Admissions)

Time: 3 Hours Maximum Marks: 100

I.	(a)	What is diffusion ? What is the difference between the interstitial diffusion and substitutional diffusion ?	(7)
	(b)	Explain the Fick's Laws governing the diffusion process.	(7)
	(c)	With a neat diagram explain the vacuum evaporation technique used for film deposition.	(6)
		OR	
II.	(a)	Explain how to fabricate the resistors and capacitors in BJT based microcircuits.	(12)
	(b)	Briefly describe the banding and packaging techniques.	(8)
III.	(a)	Discuss the CMOS properties.	(7)
	(b)	Discuss the various isolation techniques used in CMOS technology.	(13)
		OR	
IV.		Write notes on : (i) Silicon-Gate CMOS process (ii) Metal-Gate process (iii) P-well process and n-well process (iv) Latch-up problem in CMOS process.	(20)
V.	(a)	Draw the circuit arrangement for a current-mirror and explain its working by deriving necessary equations.	(10)
	(b)	Explain a temperature compensated scheme that can be used to realize a voltage reference.	(10)
		OR	
VI.	(a)	What is a decade current source ? Explain a typical arrangement.	(10)
	(b)	What is the significance of DC level shifting stage in IC technology ? With the circuit diagram, explain a typical d.c. level shift stage.	(10)
VII.	(a)	Compare the properties of thin film and thick film devices.	(10)
	(b)	What is the difference between the absolute TCR and ratio TCR ?	(4)
	(c)	Explain the resistor design in thick film technology.	(6)
		OR	
VIII.	(a)	Describe the techniques that can be employed to provide directional coupling between wave guides.	(10)
	(b)	Write brief notes on : (i) Optical space division switches (ii) Optical modulators.	(10)
IX.	(a)	What is ASIC ? Explain its advantages.	(8)
	(b)	What are the merits of IIL ? Explain the working of a typical IIL circuit with neat diagram.	(12)
		OR	
X.	(a)	What is the difference between PLAs and PALs ? Explain.	(10)
	(b)	Draw the CCD structure and explain its operation.	(10)

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