Question Paper

Exam Date & Time: 28-Apr-2018 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES END SEMESTER THEORY EXAMINATION - APRIL 2018 IV SEMESTER B. S. (ENGG) Date: 28.04.2018 Time: 9.30 A. M. TO 12.30 P.M.

Electronic Devices and Computer Interfacing [CS 241 A]

Duration: 180 mins.

Marks: 100

Answer 5 out of 8 questions.

1)	A)	Explain the classification of materials based on energy band diagram.	(10)
	B)	Define drift current and diffusion current. Write the expression for total current density.	(10)
2)	A)	Sketch and explain the input and output characteristics of npn transistor in common base configuration indicating different regions of operation.	(10)
	В)	With a neat diagram explain the working of fullwave bridge rectifier with capacitive filter. Give the expressions for ripple factor and output voltage.	(10)
3)	A)	A Silicon diode has a saturation current of 1pA at 20 ⁰ C. Determine	(10)
	.,	 (a) Diode bias voltage when diode current is 3mA (b) Diode bias current when the temperature changes to 1000C, for the same bias voltage. 	
	B)	For the zener network, V_i = 16 V, R_S = 1k, V_Z = 10 V and R_L = 3k. Determine V_o , I_Z and P_Z . Draw the circuit.	(10)
4)	A)	Realize each of the following equations using single OPAMP. Draw the circuit diagram. Derive the input output relation and determine the component values. (i) $Vo = -(5V1 + 7V2)$ (ii) $Vo = V1 - 0.5V2$	(10)
	B)	Draw the fixed bias circuit, find R_B and $R_C V_{CC}=10V$ with operating point (5V, 3mA). Assume $\beta = 100$, $V_{BE} = 0.3V$.	(10)

5)	A)	Explain the working of an opamp square wave generator.	(10)
6)	B) A)	Explain the working of a 8 bit flash ADC. Draw the circuit diagram of an RC phase shift oscillator. Give the expression for output frequency.	(10) (10)
	В)	Explain what is meant by line regulation and load regulation. Also draw ideal V-I characteristics for a Zener Diode.	(6)
	C)	For an astable multivibrator using IC555, $R_A = 390\Omega$, $R_B = 180 \Omega$, and $C = 6.8\mu$ F. Calculate T_{on} and frequency of the output.	(4)
7)	A)	Draw the cross section of n-channel enhancement mode MOSFET. What is the difference between enhancement mode and depletion MOSFETs?	(10)
	B)	Draw the cross section of SCR and label its parts. Also Draw the VI characteristics.	(10)
8)	A)	Explain the working of AC to AC converter using Triac. Draw the circuit and, input and output waveforms.	(10)
	В)	Explain the working of Opamp differentiator with proper circuit, waveforms and mathematical expression for output.	(10)

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