Question Paper

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

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
IV SEMESTER B.S. ENGG END SEMESTER EXAMINATION - Nov./ Dec. 2018
Electronic Devices and Computer Interfacing [CS 241 A]

Marks: 100 **Duration: 180 mins.**

Answer 5 out of 8 questions.

1) A) What is doping of a semiconductor? Draw the energy band diagrams and explain p-type and n-type Doping. (10)

B) Explain drift current and diffusion current with relevant expressions. (10)

2) A) Draw and explain the input and output characteristics of npn transistor in common emitter configuration indicating different regions of operation. (10)

B) With help of circuit diagram and waveforms explain the working of half-wave rectifier. Give the expressions for ripple factor and output voltage. (10)

3) A) A Silicon diode has a saturation current of 1pA at 20^0C. Determine (i) Diode bias voltage when diode current is 3mA (ii) Diode bias current when the temperature changes to 100^0C, for the same bias voltage. (10)

B) In a zener network, $R_S = 120\Omega$, $R_L = 250\Omega$ and $V_Z = 5$V. Find the I_{Zmin}, I_{Zmax}, P_{Zmin} when input varies from 9V to 15V. 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 = - (2V1 + 5V2) (ii) Vo = V1 - 0.2V2 (10)

B) Draw the fixed bias circuit for junction transistor. Determine R_B and R_C if $V_{CC} = 10$V and operating point is (5V, 3mA). Assume $\beta = 100$, $V_{BE} = 0.3$V. (10)

5)	A)	Explain the working of an op-amp integrator. Sketch the out waveform if the input is a square wave.	(10)
	B)	Draw the circuit for 8 bit flash ADC and explain it's working.	(10)
6)	A)	Draw the circuit diagram of an RC phase shift oscillator. Give the expression for output frequency.	(10)
	B)	Explain what is meant by line regulation and load regulation.	(6)
	C)	For an astable multivibrator using IC555, $R_A=390\Omega$, $R_B=180\Omega$, and C=6.8μF. 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)
	B)	Explain the working of Opamp subtractor with proper circuit and mathematical expression for output.	(10)

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