Exam Seat No:_____ Enrollment No:_____

C.U.SHAH UNIVERSITY

Wadhwan City

Subject Code : **4TE02APH1** **Summer Examination-2014** **Date: 30/05/2014**

Subject Name: Applied Physics

Branch/Semester:- B.Tech /II **Time:2:00 To 5:00**
Examination: Regular

Instructions:-
(1) Attempt all Questions of both sections in same answer book / Supplementary
(2) Use of Programmable calculator & any other electronic instrument is prohibited.
(3) Instructions written on main answer Book are strictly to be obeyed.
(4) Draw neat diagrams & figures (If necessary) at right places
(5) Assume suitable & Perfect data if needed

SECTION-I

Q-1		**Define following terms.**	**07**
	(a)	Bohr theory (any one).	01
	(b)	Diode.	01
	(c)	Energy Band.	01
	(d)	Depletion Capacitance	01
	(e)	PIV.	01
	(f)	Intrinsic semiconductor & Extrinsic Semiconductor.	02
Q-2	(a)	Write a short note on Mass Action Law of Semiconductor.	05
	(b)	Explain the drift and diffusion current for a semiconductor.	05
	(c)	Find the conductivity of silicon (i)in intrinsic condition at a room temperature of 300K, (ii)with impurity of 1 in 10^8 , Given that n_i for silicon at 300K is $1.5*10^{10} cm^{-3}$, μ_n =1300 cm^2/V-s, μ_p=500 cm^2/V-s number of Si Atoms per cm^3=$5*10^{22}$	04
		OR	
Q-2	(a)	Explain Switching characteristics of P-N junction diode with neat Sketch and graph.	05
	(b)	Write a short note on Tunnel Diode.	05
	(c)	Explain how the zener diode can be used as a voltage regulator.	04
Q-3	(a)	Explain full wave rectifier and draw waveforms. Find all voltage and current equations.	07
	(b)	A 50ohm load resistance is connected across a half wave rectifier. The input supply voltage is 230V (rms) at 50 Hz. Determine the DC output (average) voltage, peak-to-peak ripple in the output voltage (Vp-p), and the output ripple frequency (fr).	07
		OR	
Q-3	(a)	Write short note on capacitance filter.	07
	(b)	Explain the LED diode and Varactor Diode. Define load line in simple diode circuit.	07

SECTION-II

Q-4		Define following terms.	07
	(a)	Amplifier.	01
	(b)	FET.	01
	(c)	Optical Fiber.	01
	(d)	LASER.	01
	(e)	Bias Stability.	01
	(f)	JFET.	01
	(g)	Load line for transistor.	01
Q-5	(a)	Derive the relationship between α and β.	05
	(b)	Why does the CE configuration provide large current amplifier while the CB configuration does not ?	05
	(c)	A transistor has I_B= 100μA and I_C = 2 μA. Find (i) β of the transistor, (ii) α of the transistor, (iii) emitter Current I_E , (iv) if I_B change by +25 μA and I_C change by +0.6 mA, find the new value of β.	04
		OR	
Q-5	(a)	Explain the construction of FET with its V-I characteristics.	05
	(b)	Discuss the FET as a voltage variable resister.	05
	(c)	Explain with help of neat sketch of FET pinch- off Voltage.	04
Q-6	(a)	Give brief introduction of optical Fiber and its applications.	07
	(b)	What are the different configurations of BJT and Explain.	07
		OR	
Q-6	(a)	Why BJTs are called bipolar devices and FETs are called unipolar devices? Explain.	07
	(b)	What is an Optical Communication? Explain it with an example.	07

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