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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

II Sem B.E. (Credit System) Mid Semester Examinations - I, February 2016

15EC112 – BASIC ELECTRONICS

ration: 1 Hour — Max. Marks: 20

*Note: Answer any **One** full question from **each Unit**.*

		Marks	BT*
	Unit – I		
a)	Show the circuits required for obtaining forward bias and reverse bias V-I characteristics for germanium diode. Sketch characteristics, mark cut-in voltage, r_d (dynamic forward resistance), reverse breakdown voltage and explain.	6	L*2
b)	Sketch one approximate characteristic and draw the corresponding electrical equivalent circuits for Silicon diode. This diode is in series with a resistance of 200 ohms. If the input DC voltage is 10 volts, what is the value of load current for this approximation?	4	L3
a)	Sketch forward V-I characteristic for PIECEWISE LINEAR approximation for a silicon diode where cut- in voltage and a dynamic resistance are considered for representing diode and explain. Show the electrical equivalent circuit for this case.	5	L3
b)	Discuss LOAD LINE analysis for diode circuit in forward bias. Diode is connected to a 10 volts d.c supply with a series resistance of 250 ohms. Show to scale the load line for this resistance.	5	L4
	Unit – II		
a)	With circuit diagram and relevant waveforms discuss the operation of a half wave diode rectifier. Derive expressions for output average voltage and % voltage regulation considering diode to have forward conducting resistance R_f.	6	L3
b)	Input tranformer in a 2 diode **FWR** has secondary rating of 15 -- 0 -- 15 volts. If load resistance is 100 ohms, determine (i) average load current, (ii) a.c. power into rectifier. Consider diodes as ideal.	4	L4
a)	Sketch V-I characteristics of ZENER diode. Mark location of V_z and I_{zk}. Define these parameters.	5	L2
b)	A voltage regulator using a Zener is to produce a constant output voltage of 5 across a load resistance of 50 ohms, from an input d. c. supply of 12 volts. The Zener requires a minimum current of 10 mA to sustain reverse breakdown. Calculate value of series resistance required. Draw the circuit and show the values. In the circuit designed, if the load is disconnected what will be the power dissipation in the Zener?	5	L4

oom's Taxonomy, L* Level

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