Nepal College of Information Technology

**Unit Test**

Fall 2012

Program : BE CE Time : 2 hrs

Semester : (III) FM : 70

Subject : Electronic Devices PM : 35

* *Candidates are requested to give their answer as far as practicable in their own words.*
* *The figure in the margin indicates the full marks*
* ***Attempt ALL question***

1. a) Explain the properties of non-linear devices. 7

OR

“Diode is a non-linear device”. Justify it.

b) Find is and vs for the circuit given below. 8

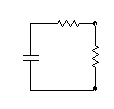
**–**

1k

2k

16V

Non linear element



vs

is

VS

**+**

**–**

**+**

Assume is = (Vs –VTR)2 where A = 1 mA/V2 and VTR = 0V.

2. a) How a Diode is modelled in Piecewise linear model. Explain Diode resistances. (4+4)

b) Find the piecewise linear model of silicon diode with Is = 10-11 A and η = 1.6 in the vicinity of operating point ID = 1mA. 7

3. a) What do you mean by reverse recovery time of diode. Explain with timing diagrams. 7

b) Explain the Transition capacitance and Diffusion capacitance of PN junction. 8

4. a) How breakdown occurs in Zener diode? Explain the VI characteristics of Tunnel diode. (4+4)

OR

Explain how Zener diode acts as a voltage regulator when –

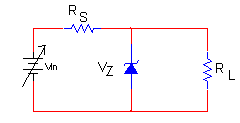
a) load and source are fixed

b) fixed load and variable source

c) variable load and fixed source

b) Determine the range of values of of Vi that will maintain the Zener diode in the “on” state.

Where Rs = 220RL= 1.2KVz= 20Vand Izm = 60mA in the figure shown below: 7



5. Write short notes. (Any two) 10

a) Schottky Diode

b) Formation of pn junction

c) Barrier potential

d) Intrinsic and extrinsic semiconductor