FACULTY OF ENGINEERING
B.E. 2/4 (ECE) I Semester (Suppl.) Examination, July 2012
ELECTRONIC DEVICES

Time : 3 Hours]   [Max. Marks : 75

Note : *Answer **all** questions from Part **A**.*
*Answer **any five** questions from Part **B**.*

PART – A   (25 Marks)

1. Explain the formation of depletion region in a PN junction.   2

2. Determine the forward bias voltage applied to a silicon diode to cause a forward current of 20 mA and reverse saturation current, Io = 20×10^{-6} A at room temperature.   3

3. Compare LED and LCD. What are the advantages of LCD over LED ?   3

4. A diode with Vf = 0.7 V is connected as a half wave rectifier. The load resistance is 1 kΩ and the (rms) ac input is 22 V. Determine the peak out put voltage, the peak load current and diode PIV.   3

5. Draw the input output characteristics of CB configuration.   2

6. Write the equations for calculating R_B and R_C for a base bias circuit.   3

7. Draw the equivalent h-parameter model for common emitter configuration.   2

8. Compare V-I characteristics of SCR and TRIAC.   3

9. What are the advantages of FET over BJT ?   2

10. Define the pinch-off voltage, sketch the depletion region before and after pinch off.   2

PART – B   (50 Marks)

11. a) The diode current is 0.6 mA when the applied voltage is 400 mV, and 20 mA when the applied voltage is 500 mV. Determine η. Assume $\dfrac{kT}{q} = 25$ mV.   5

    b) Explain zener voltage regulator also give its limitations.   5

12. a) Draw and explain the operation of full wave rectifier with capacitive filter. 5

b) Draw V-I characteristics of tunnel and varactor diode. 5

13. a) Explain the pnp transistor current components. 5

b) What is stability factor ? Derive the stability factor of a self bias circuit. 5

14. A voltage source of internal resistance $R_s = 900\ \Omega$ drives a CE amplifier using $R_L = 2k\Omega$. The CE h-parameters are $h_{ie} = 1200\Omega$, $h_{re} = 2\times10^{-4}$, $h_{fe} = 60$ and $h_{oe} = 25\ \mu A/V$. Compute A_I, R_i, A_v and R_o using approximate analysis and exact analysis. 10

15. a) Draw and explain the V-I characteristics of UJT. 5

b) Write a short notes on CCD, bias stabilisation and compensation techniques. 5

16. a) A FET has a driven current of 4 mA. If $I_{DSS} = 8$ mA and $V_G s(off) = -6$ V. Find the values of V_{GS} and Vp. 5

b) Show that in a FET trans conductance $gm = \dfrac{2\sqrt{I_{DS}.I_{DSS}}}{Vp}$. 5

17. Write a short notes on : 10

a) Bridge rectifier

b) Thermal run way

c) CRO.

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