Code No. 6017 / S

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (Suppl.) Examination, July 2014

Subject: 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 The reverse saturation current of a silicon PN junction diode is 15 μA. Calculate the diode current for the forward bias voltage of 0.6 V at 25°C. 3

2 Difference between Zener breakdown and Avalanche breakdown. 2

3 Define ripple factor and transformer utilization factor of a rectifier. 2

4 Draw V-I characteristics of tunnel diode and give some applications. 3

5 What is mean by thermal runaway? 2

6 Define α, β and γ of a transistor. Show how they are related to each other. 3

7 What are the characteristics and applications of common collector amplifier? 3

8 Difference between SCR and Triac. 2

9 Determine the values of resistors R_D and R_S for the self-based p-channel JFET having the parameters. VP = 5 V, I_{DSS} = 12 mA, V_{DD} = 12 V, I_D= 5 mA and V_{DS} = 6 V. 3

10 Draw the transfer characteristics of MOSFET. 2

PART – B (50 Marks)

11 a) Explain diode switching characteristics with wave forms. 5

b) Reverse saturation current of a silicon diode is 8 μA. Calculate the current flowing through the diode when the applied forward bias voltages are 0.5 V, 0.6 V and 0.7 V at room temperature. 5

12 Explain a bridge rectifier with Ckt diagram and wave forms. Why bridge rectifier is preferred then centre tapped rectifier. Derive (i) I_{dc} (ii) TUF (iii) Ripple factor (iv) Efficiency (v) Form factor. 10

13 a) Show that ripple factor of full wave rectifier with capacitive filter is (γ) = $\frac{1}{4\sqrt{3}\ f.c.RL}$. 6

b) Difference between LED and LCD. 4

14 A CE transistor amplifier with voltage divider bias circuit having the quiescent point at V_{CE} = 12 V. I_C = 2 mA and stability factor S ≤ 5 of V_{CC} = 24 V, V_{BE} = 0.7 V, β = 50 and R_C = 4.7kΩ. Determine R_1 and R_2 and R_E. 10

15 A common base transistor amplifier driven by a voltage source of internal resistance R_s = 1.2 kΩ, the load impedance is 1 kΩ. The h - parameters are h_{ib} = 22Ω, h_{rb} = $3x10^{-4}$, h_{fb} = -0.98 and h_{ob} = 0.5 μA/V. Compute the current gain A_I, Inpute Impedance R_i voltage gain A_v, overall voltage gain A_{vs}, overall current gain A_s, and power gain. Use exact analysis. 10

16 a) Compare JFET with BJT. 5

b) Prove that transconductance of FET $g_m = \frac{-2}{V_P}\sqrt{I_{DSS}.I_{DS}}$ 5

17 Write short notes on:
a) Uni junction transistor b) Early effect c) Varactor diode (4 + 3 + 3)

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