Code No. 3027

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I - Semester (Main) Examination, November / December 2016

Subject : Electronic Devices

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1 Differentiate between transition capacitance and diffusion capacitance of PN junction diode. (2)
2 The diode current is 0.6mA when the applied voltage is 400mV and 20mA when applied voltage is 500mV. Determine η. Assume kT/q =25mV (3)
3 What are the advantages and disadvantages of bridge rectifier? (2)
4 Explain the purpose of bleeder resistor in LC or L section filter? (2)
5 What is Early Effect or Base Width Modulation in a transistor? (2)
6 What is thermal runaway in transistors? Write a condition to avoid this. (3)
7 Why h-parameters are preferred to analyze a circuit using BJT. (2)
8 What are the differences in BJT and FET? (3)
9 Sketch and explain the small signal model of JFET. (3)
10 For a transistor find β, α and I_E when I_C = 5mA, I_B =100μA. (3)

PART – B (50 Marks)

11 (a) What is PN junction diode? Explain the working of PN junction under forward bias and reverse bias with neat diagram? (6)
(b) Write the differences between Zener break down and Avalanche break down in diodes? (4)

12 (a) Derive ripple factor of full wave rectifier with choke or Inductor filter? (5)
(b) A 220V, 50Hz ac voltage is applied to the primary of 4:1 step down transformer which is used in full wave rectifier having a R_L = 1KΩ uses Si diode with R_f = 50Ω. Determine the following. (i) DC output voltage (ii) DC power delivered to load (iii) PIV of each diode (iv) Efficiency η (v) Ripple frequency (5)

13 (a) Derive the stability factor equation for a Collector to base bias circuit. (5)
(b) In the case of collector to base circuit if β =40, Rc = 4.7KΩ and R_B= 80KΩ. Determine the value of stability factor S. (5)

14 (a) How to derive an approximate model from exact model of h-parameters. Draw an approximate model for CE amplifier. (5)
(b) A junction transistor connected in self bias has the following h-parameters h_{ie} = 1200Ω, h_{re} = 2×10^{-4}, h_{fe} = 60, h_{oe} = 25μA/V. Determine the A_I, A_V, Z_i, Zo of the CE amplifier using exact analysis. The load resistance R_L = 2KΩ, source resistance R_S= 900Ω, R_1=50KΩ, R_2=1KΩ and R_C=1KΩ. (5)

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15 (a) Explain the construction and operation of n-channel JFET and draw drain and transfer characteristics. (6)
(b) Differentiate between depletion and enhancement MOSFETS. (4)

16 (a) Draw and explain the circuit of Uni- Junction transistor and plot the I_V characteristics. (5)
(b) Compare CB, CE and CC amplifier performance parameters. (5)

17 Write short notes on the following. (10)
(a) Bias compensation techniques
(b) FET as voltage variable resistor
(c) Silicon Controlled Rectifier

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