FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (Main) Examination, Nov./Dec. 2012

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. Differentiate between transition capacitance and diffusion capacitance of a P-N junction diode. (2)
2. Determine a.c resistance for semiconductor diode with a forward bias of 0.25 V. Reverse saturation current at room temperature is of 1.2μA. (3)
3. Why is bleeder resistance employed in a filter circuit? (2)
4. In a bridge rectifier circuit peak value of secondary voltage is $240\sqrt{2}$ V and frequency is 50 Hz. Determine the (i) No load output D.C. voltage (ii) Output frequency. (3)
5. A transistor has α=0.98. If emitter current of the transistor is 1 mA, determine base current and gain factor 'β'. (3)
6. What is early effect? Explain how it affects the BJT characteristics in CB configuration. (2)
7. How does a UJT differ from a FET? (3)
8. Draw the equivalent h-parameter model for C.B configuration. (2)
9. What is meant by depletion region in JFET? Explain.
10. Prove that the trans conductance g_m of JFET is given by $g_m = \dfrac{.2}{|v_p|}\sqrt{I_{DS}.I_{DSS}}$ (3)

PART – B (50 Marks)

11. (a) The reverse bias saturation current for a P-N junction diode is 1μA at 300°K. Determine its a.c resistance at 150 mV forward bias. (4)
    (b) Explain the working of P-N junction under forward bias and reverse bias with neat circuit diagrams. (6)

12. (a) Design a filter for full wave rectifier circuit with LC filter to provide an output voltage of 25V with a load current of 100 mA and its ripple is limited to 3%. (6)
    (b) Explain the construction and working principle of LED. What are the merits of LED's. (4)

13. (a) Draw the circuit of self-biased CE-amplifier using diode compensation for I_{co}. Describe how bias compensation is achieved. (6)
    (b) Distinguish between d.c and a.c load lines with suitable examples. (4)

14. A C.E amplifier is driven by a voltage source of internal resistance R_s = 800 , the load impedance is a of 2 k . The h-parameters are h_{ie} = 1.1 k, h_{fe} = 50, h_{oe}= 25Micro ohms, h_{re} = 2.5x10^{-4}. Compute the current gain A_i, input resistance R_i, voltage gain A$\in$, output resistance R_o and output terminal resistance R_{o1}. Also calculate power gain A_p using approximate analysis. (10)

15. (a) Explain the construction and working of a TRIAC. Sketch its V–I characteristics. (6)
    (b) Write a short notes on CCD. (4)

16. (a) Explain the basic construction of a n-channel depletion type MOSFET. Draw and explain its characteristics. (6)
    (b) What are the advantages of MOSFET over JFETs? (4)

17. Write a short notes on:
    (a) Compensatuion techniques (4)
    (b) LCD (3)
    (c) Varactor diode (3)

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