

FACULTY OF ENGINEERING
B.E. 2/4 (ECE) I-Semester (Main) Examination, November 2013

Subject : Electronic Devices

Time : 3 Hours

Max. Marks: 75

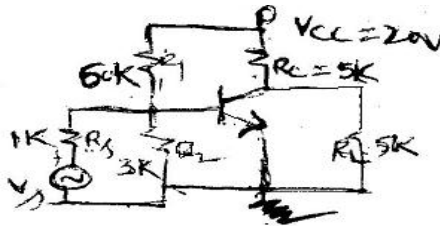
Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Compare Avalanche and Zener Breakdown mechanisms. (2)
2. How, junction capacitance come into existence in P-N Junction diode? (2)
3. Why series inductor and L-section filters cannot be used with half-wave rectifiers? (2)
4. A Halfwave rectifier, having a diode of resistance $1k\Omega$ and a load of $1k\Omega$ rectifies an a.c. voltage of 230V, peak value. Calculate peak, average and r.m.s. values of current. (3)
5. Draw the circuit of common emitter configuration. Sketch the output characteristics. Indicate the active, saturation and cutoff regions. (3)
6. What is thermal runaway in transistor amplifier circuits? (2)
7. Compare V-I characteristics of DIAC and SCR. (3)
8. Draw the equivalent h-parameter model for C.E. configuration. (2)
9. Sketch and explain the basic structures of an N-channel junction field effect transistors. (3)
10. An N-channel JFET has $I_{DSS} = 10mA$ and $V_p = -4V$. Determine the minimum value of V_{ps} for pinch-off region and drain current I_D $V_{GS} = -2v$ in pinch-off region. (3)

PART – B (50 Marks)

- 11.(a) Find the Dynamic resistance of a P-N junction diode at a forward current of 2mA. Assume $\frac{KT}{e} = 25mv$. (4)
- (b) Derive the expression for the diffusion capacitance C_D in case of P-N junction diode. (6)
- 12.(a) For a full wave rectifier circuit, find the average, RMS and peak values of currents through the diode, if the voltage across half of secondary is $15 \sin 314t$. Also calculate the PIV of diode. [assume ideal diodes and $R_L=1k\Omega$]. (6)
- (b) Draw V-I characteristics of Backward diode and explain its operation. (4)
- 13.(a) Draw the circuit of self-biased CE amplifier using diode compensation for V_{BE} . Describe how bias compensation is achieved. (6)
- (b) Derive the stability of a self bias circuit. (4)
14. For the transistor amplifier show in figure (1) below $h_{ie}=1.5k\Omega$, $h_{fe}=100$, $h_{re}=3 \times 10^{-4}$, $h_{oe}=25 \mu v$ calculate A_i , R_i , A_v and Y_o . (10)



- 15.(a) Explain the construction and working of a SCR, sketch its V-I characteristics. (6)
- (b) How will you find h-parameters for transistor in CE configuration using graphical Analysis? (4)
- 16.(a) Explain the basic operation and characteristics of enhancement type. (6)
- (b) List the methods used to MOSFET the threshold voltage (V_T). (4)
17. Write short notes on the following:
 - (a) Full wave rectifier (4)
 - (b) Photo diode (3)
 - (c) C.C.D. (3)