

(Please Write your Roll No. immediately)
First - Term Examination

Roll no.

Third Semester (B.Tech)
Paper Code : ETCS : 203
Time 1.5 Hrs.

September , 2008
Subject : Analog Electronics
Max. Marks : 30

Note : Attempt Q.No. 1 and any two more Question Assume the missing data, if any

- Q1. (a) Name the diode which is used in High Speed Switching applications & Why ? (1)
- (b) Name two semi conductors except Si & Ge. (1)
- (c) Draw the VI characteristics of a Tunnel diode. (1)
- (d) Define voltage Equivalent of Temperature. (1)
- (e) Find the factor by which the reverse saturation current of a silicon diode will get multiplied when the temperature is increased from 27°C to 82°C . (2)
- (f) In a certain transistor 99.6 % of the carriers injected in to the base cross the collector base junction . if the leakage current is 5 microamp. and collector current is 20 mA Calculate (i) the value of α_{dc}
(ii) the emitter current (2)
- (g) A bar of intrinsic Ge 6cm long is subjected to a potential difference of 12v, if the velocity of electron in bar is 73m/s determine the mobility of electron. (2)
- Q2. (a) Draw the band diagram for a reverse biased P-n junction. (2)
- (b) For the circuit shown in Fig. 1 the input is $50\sin\omega t$. Draw the transfer Characterstic and input-output waveforms, assuming ideal diodes. (4)
- (c) For the circuit shown in Fig. 2 . Prove that the floating emitter to base voltage is given by $V_{EBF} = V_T \ln (1 - \alpha_n)$ Neglect $r_{bb'}$. (4)
- Q3. (a) Two P-N junction Ge diodes are connected in series as shown in Fig. 3, A 5V Battery is impressed upon this series arrangement. Find the Voltage across each at room temperature. Assume that the magnitude of Zener Voltage is greater than 5V. (4)
- (b) Explain the difference between Zener breakdown & Avalenche breakdown. (2)
- (c) For a bridge rectifier calculate E_{dc} , I_{rms} , Efficiency, Ripple Factor & TUF. (4)

4. (a) The reverse saturation current of Ge transistor in Fig. 4, is 2 microamp. at room temperature (25°C) and increases by a factor of 2 for each temperature increase of 10°C . The bias $V_{bb} = 5\text{ V}$. Find the maximum allowable Value for R_B if transistor is to remain in cutoff at a temperature of 75°C . (4)
- (b) Draw and Explain input and output characteristics of CE and CB configuration, also explain Early Effect. (4)
- (c) Explain the difference between transistion & diffusion capacitance. (2)

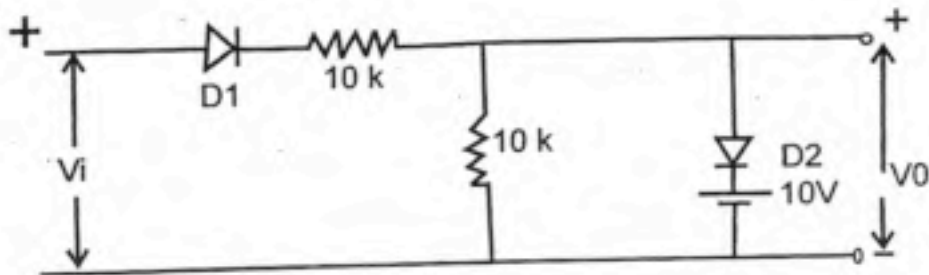


Fig 1

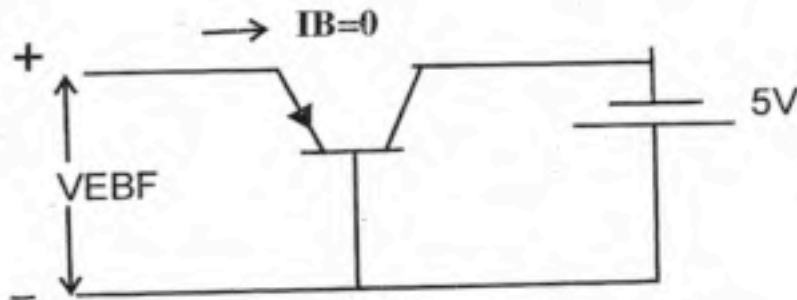


Fig 2

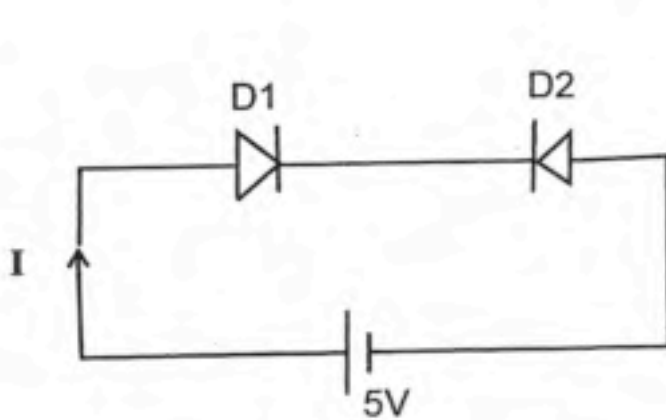


Fig 3

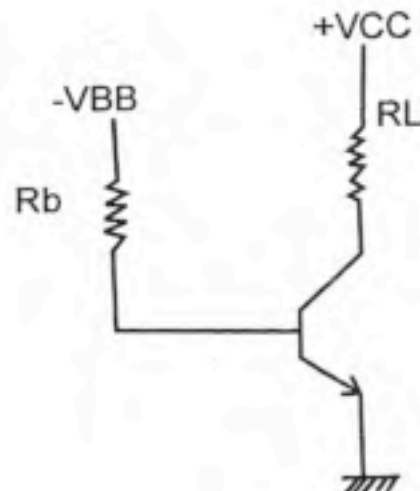


Fig 4