Roll No ....

EC - 304

B.E. III Semester

Examination, December 2013

Electronics devices

Time : Three Hours

Maximum Marks : 70

Note: Attempt any one question from each unit. Assume suitable data if missing.

Unit - I

1. Explain Hall Effect and its applications. Discuss Transition and Diffusion capacitance. Differentiate between Diffusion and drift currents. When a reverse bias is applied to a germanium PN. Junction diode, the reverse saturation current at room temperature is 0.3 µA. Determine the current flowing in the diode when 0.15V forward bias is applied at room temperature.

OR

2. Discuss the effect of temperature on PN Junction Diodes. Prove that the conductivity of a semi-conductor is given by $\sigma = q\,(p\mu_p + n\mu_n)$ State and explain Mass-Action law? Write PN Diode applications.

Unit - II

3. Discuss PN Junction diode as a rectifier. Differentiate between clipper and clamper circuits. A silicon diode has a saturation current of 7.5 µA at room temperature 300°K. Calculate the saturation current at 400°K.

OR

4. Explain piecewise linear approximation model of a diode. Define a load line in a simple diode circuit. Determine the forward resistance of a PN junction diode when the forward current is 5mA at T = 300°K. Assume silicon diode.

Unit - III

5. Write short notes on :
   a) Zener Diode   b) Varactor Diode

OR

6. Write short notes on :
   a) PIN Diode   b) LED

Unit - IV

7. Discuss early effect and Ebers-Moll model for a BJT? Calculate the values of I_C and I_E for a transistor with $L_{dc} = 0.99$ and $I_{CBO} = 5\mu A$. I_B is measured as 20µA.
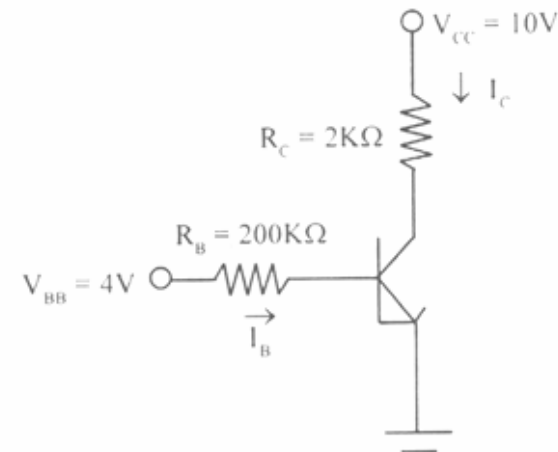
OR

8. Discuss input and output characteristics for CE - configuration BJT.

Unit - V

9. Write a short note on Uni-Junction Transistor and FET?

OR

10. Determine the base collector and emitter currents and V_{CE} for a CE circuit shown in figure (1). For $V_{CC} = 10V$, $V_{BB} = 4V$, $R_B = 200K\Omega$, $R_C = 2K\Omega$, $V_{BE}(on) = 0.7V$, $\beta = 200$.

What is meant by Q-point? What is need for biasing a transistor? Explain how a transistor works as an amplifier. Write applications of JFET?

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