SOLID STATE DEVICES AND CIRCUITS

CLASS TEST NO. 1

Q.1 a] Explain V-I characteristics of diode.   3M

b] Write a note on (Any two)   4M

    1. Switching diodes

    2. Fast recovery diodes

    3. Photodiodes

Q.2   Explain need of biasing BJT. Which are the types Of biasing BJT.   6M

Q.3   Design a voltage divider bias circuit for the Specified conditions.

Vcc=12V, Vce=6V, Ic=1mA, s=20, β=100 & Ve=1V   7M

OR

Q.4   For a single stage BJT CE amplifier,If Vcc=20V, Rc=2k, β=50, Vbe(act)=0.2V, R1=10K, R2=5K, Re=100ohm.Calculate Ib,Vce,Ic & stability factors.   7M

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Q.1 a. Under what condition is the small model of a diode used in the analysis of a diode circuit? And define a load line in a simple diode circuit.   ⑧

   b. Describe the characteristics, specification and application of switching diode.   ⑦

OR

Q.2 a. Explain with characteristics small signal and large signal diode models for forward and reverse biased conditions.   ⑦

   b. perform d.c. and a.c. analysis of the circuit shown below. Find d.c. and a.c. current and voltage components. Assume Vs=5V, R=5KΩ, Vr=0.6V, Vi=0.1sinωt(V)   ⑧
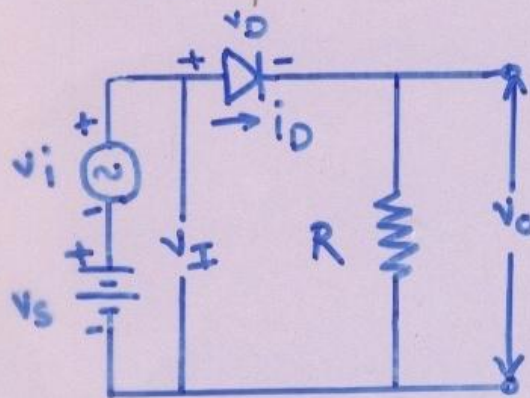
Q.3 a. What is thermal runaway in BJT? Derive the condition for thermal stability & show that VCE<Vcc/2 (7)

b. Draw a small signal equivalent circuit of BJT using h-parameters for common emitter configuration. Explain significance of each parameter with formula. State the benefits of h-parameters. (8)

OR

Q.4 a. What is the principal difference between biasing techniques used in discrete transistor circuits and integrated circuits? (7)

b. For the circuit shown in fig. find IBQ,ICQ and VCEQ for circuit parameters, Vcc=5V, R1=9KΩ, R=2.25KΩ, (8) RE=200Ω, Rc=1KΩ and β=150
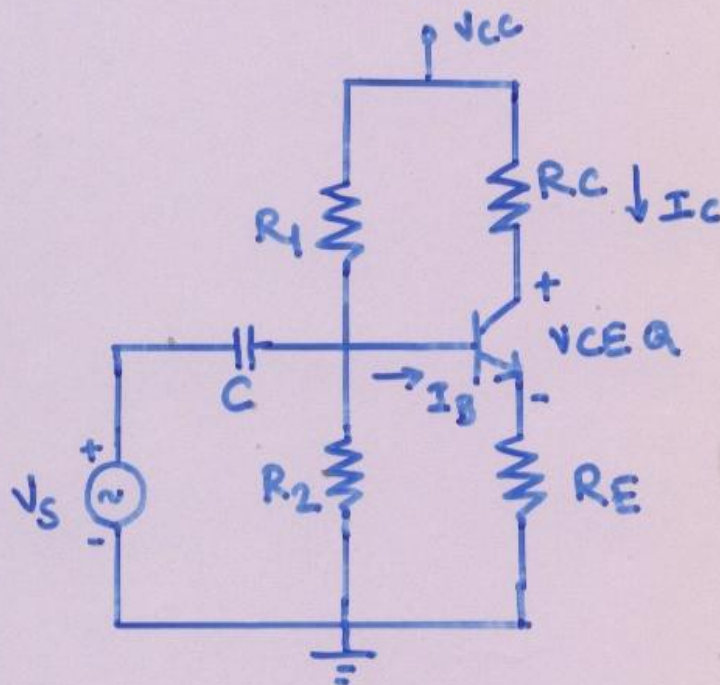
Bharati Vidyapeeth's College of Engineering for Women, Pune

Electronics and Telecommunication Department

Unit Test: 1 (Marks:30) Academic Year:2011-12

Subject: SOLID STATE DEVICES AND CIRCUITS

Q.1 Under what conditions small signal model of a diode used in the analysis of a diode circuit and define a load line in simple diode circuit. 7M

Q.2 Describe the characteristics, applications, specifications of switching diode. 7M

Q.3 The transister amplifier uses a transistor with hie=1.1k,hfe=2.5*10^-4 and

hoe=2.5*10^-6A/v. Calculate Ai=I0/Ii, Av, Avs, Ro, Ri. 8M

Q.4 In single stage common emitter BJT amplifier Vceq=6V, Icq=10mA, BC547BP Vbe=0.7V.Find all resister values Cc1=Cc2=Ce=10microF. 8M

Bharati Vidyapeeth's College of Engineering for Women, Pune

Electronics and Telecommunication Department

Unit Test: 2 (Marks:30) Academic Year:2011-12

Subject: SOLID STATE DEVICES AND CIRCUITS

Q.1.a Write short notes on any two:

   a] Crystal Oscillator

   b] Wein Bridge Oscillator

   c] Distortion in amplifier and total

   harmonic distortion.

Q.1.b With the help of neat circuit diagram explain the operation of complementary class AB amplifier.Explain the significance of class AB.

Q.2.a Explain with neat diagram BICMOS inverter.

Q.2.b Explain 3 non ideal characteristics of MOSFET

   i) finite output resistence

   ii) Body effect

   iii) Subthreshold type conduction

Q.3.a Explain how even harmonic gets cancelled in class B push pull amplifier.

Q.3.b Describe the construction of power MOSFET

VMOSFET and DMOSFET.