

College of Engineering, Pune
End-Semester Examination – November 2011

S. Y. B. Tech. Electrical
(EE 201 Solid State Devices and Linear Circuits)

Day & Date: – Sunday, 27 November 2011

Time: – 8:00 am to 11:00 am

Maximum Marks: – 50

Duration: - 03.00 Hrs

Instructions:-

1. Read all the questions carefully.
2. Use of programmable calculator is strictly not allowed.
3. Assume suitable data where ever necessary.

Q.1 A) Explain with the help of neat diagram – ‘Diode switching time’. (2)

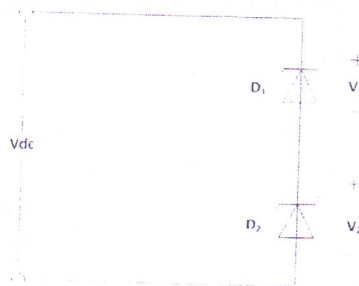
B) 2 Ge zener diodes are connected in series across a supply V_{dc} as shown in fig. (5)
The reverse saturation current of D_1 and D_2 are $1\mu A$ and $2\mu A$ respectively.
The breakdown voltage of each diode is $100V$.

(a) Calculate current through and voltage across each diode if,

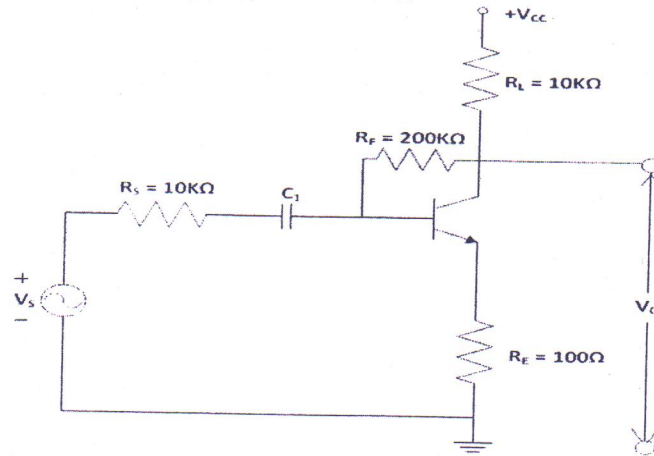
Case 1 – $V_{dc} = 90V$

Case 2 – $V_{dc} = 110V$

(b) Repeat part (a), if each diode is shunted by $10M\Omega$ resistor.



C) For the circuit shown in fig., calculate A_I , A_v and R_i . Transistor parameters (3)
are: $h_{ie} = 1.1K\Omega$, $h_{re} = 2.5 \times 10^{-4}$, $h_{fe} = 50$ and $h_{oc} = 25\mu A/V$.



Q.2 A) Draw the V-I characteristic for the following circuits assuming cut in voltage (2) for each of the diode as 0.7 V.

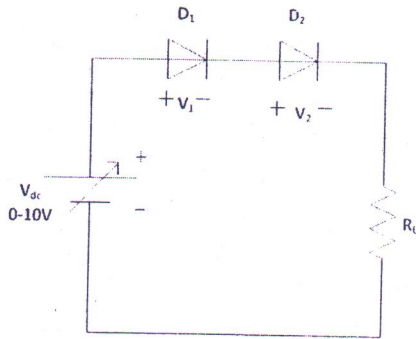


Fig (a)

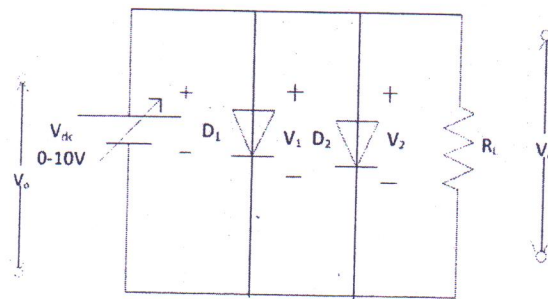
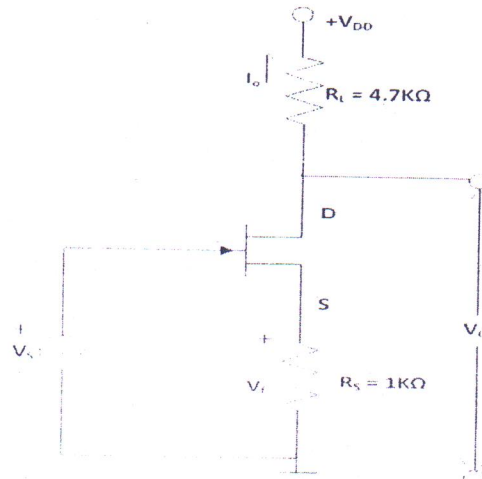


Fig (b)

B) For the feedback amplifier shown in fig., identify topology and calculate (5) Gain, A_{vf} , R_i , R_o and D.

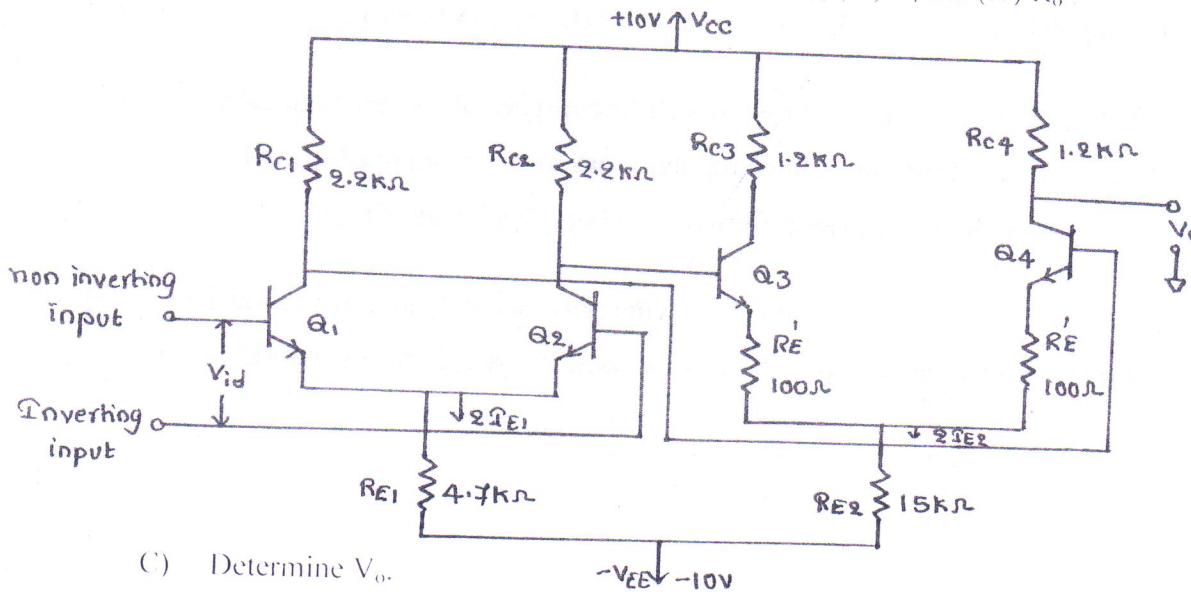


- C) A transformer coupled class A power amplifier having collector supply (3)
voltage of 15V delivers maximum output power of 3Watt to a load resistance
of 1.5Ω connected to the secondary of ideal output transformer. Determine
i) Turns ratio of the output transformer,
ii) Power rating of the transistor,
iii) DC power input to the amplifier.

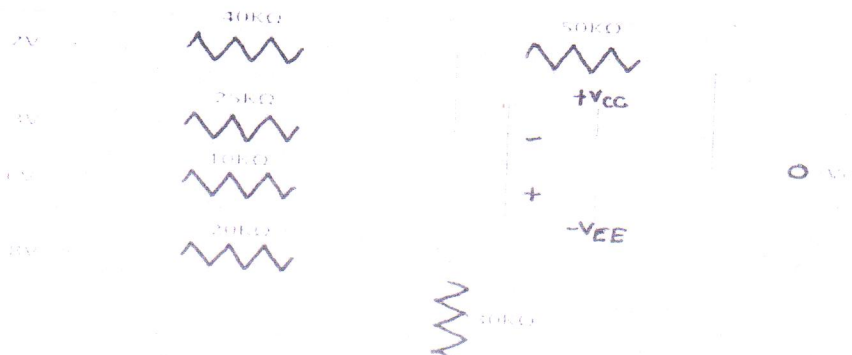
Q.3 A) Give the h parameter conversion formulae for CB and CC configuration in (2)
terms of CE configuration.

B) For the circuit shown in fig., determine (5)

- (i) I_C and V_{CE} for each of the transistor, (ii) A_V , (iii) R_i and (iv) R_o .



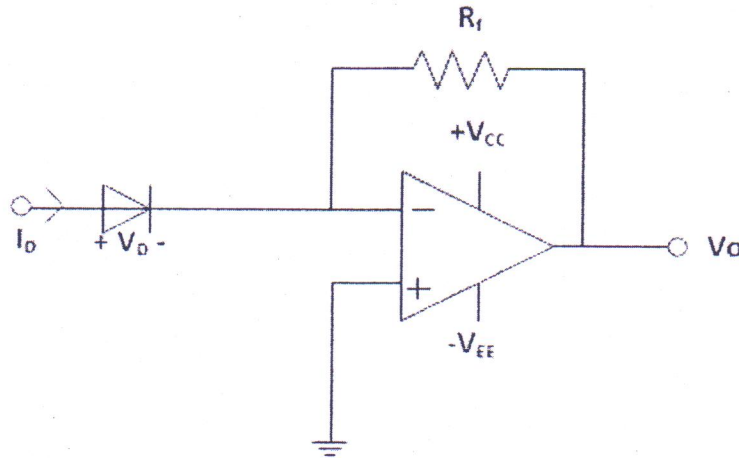
C) Determine V_o . (3)



Q.4 A) Distinguish between filtering, amplification, attenuation and distortion. (2)

B) Explain the working of PLL using appropriate diagram and define capture range, lock range and free running frequency range. (5)

C) Determine V_o . (3)



Q. 5 A) Distinguished between the two operating modes of 555 timer IC. (2)

B) What is a voltage regulator? List four different types of voltage regulators. (5)
What edge an adjustable voltage regulator has over a fixed one? In what sense, a switching amplifier differs from other types of amplifiers?

C) What must be the relationship between the pulse width t_p and the period T of the input trigger signal if the 555 is to be used as a divide by 4 network? (3)
