

Question Paper Code: 11282

B.E./B.Tech. Degree Examinations, April/May 2011

Third Semester

Electronics and Communication Engineering

EC 2205 – ELECTRONIC CIRCUITS – I

(Regulation 2008)

Time : Three Hours

Maximum: 100 Marks

Answer ALL Questions

PART A – (10 × 2 = 20 Marks)

1. Draw the single stage self-biased circuit using pnp transistor.
2. What is the need for biasing in transistor Amplifier?
3. If CMRR of an amplifier is 100 dB, calculate. Common mode gain, if the differential gain is 1000.
4. Two identical amplifiers are cascaded (having 10 dB gain each). Calculate the output voltage if the input of 1 mV (p-p).
5. Draw the Hybrid-PI Equivalent circuit of BJT.
6. Calculate the amplification factor, μ of FET, if $r_d = 4$ kilo ohm and $g_m = 4$ mA/V.
7. Differentiate between class A and transformer coupled class A Amplifiers in terms of (a) operating point and (b) efficiency.
8. List the Condition periods of Class A, Class B and Class C amplifiers.
9. The theoretical maximum conversion efficiency of Fullwave rectifier is
10. What are the advantages of SMPS?

PART B – (5 × 16 = 80 Marks)

11. (a) (i) Define stability factor.
11. (a) (ii) The pnp transistor in the circuit of figure 1 has Beta = 50. Find the values of R_c to obtain $V_c = 5$ V. What happens if the transistor is replaced with another Beta = 100?

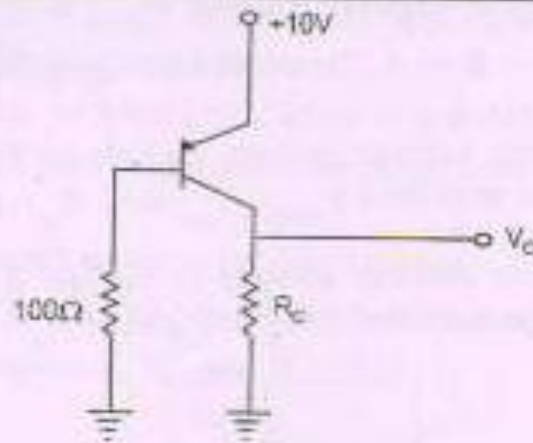


Fig. 1
(or)

11. (b) (i) Derive the expression of stability factor for collector feedback amplifier.
11. (b) (ii) Calculate the operating point for figure 2.

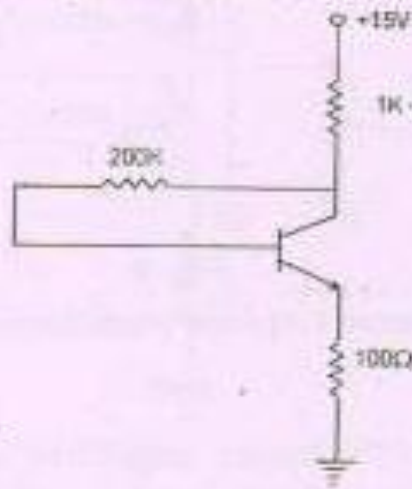


Fig. 2

12. (a) (i) Describe the method to increase the input resistance using Darlington connection.
12. (a) (ii) Define CMRR.
12. (a) (iii) Write short notes on multistage amplifiers.

(or)

12. (b) For the circuit of figure 3, find the voltage gain when the capacitance is connected and when capacitance is not connected factors R_e),

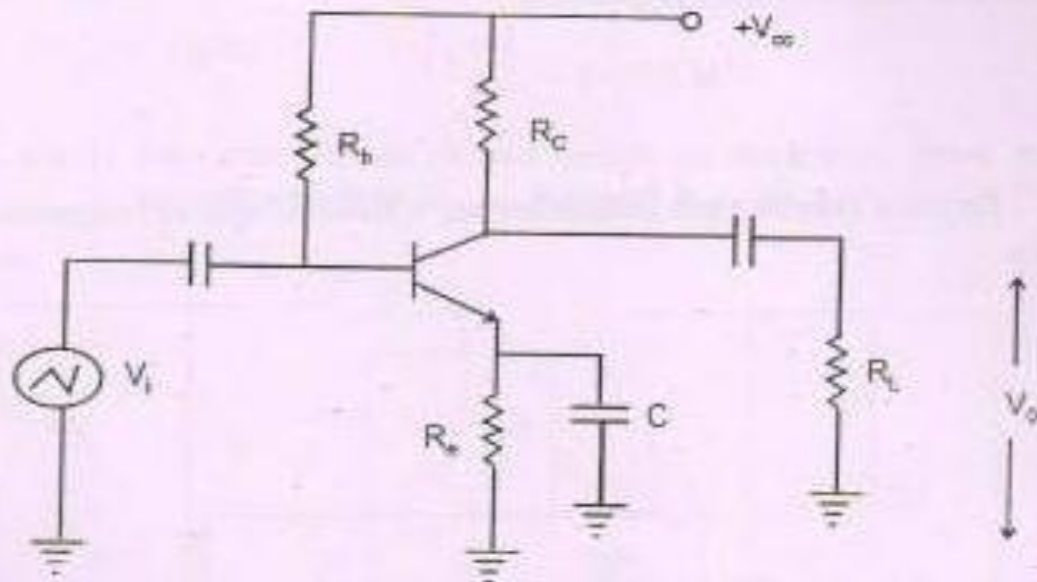


Fig. 1

13. (a) For the circuit of figure 4 we have $R = 100 \text{ k ohm}$, $R_{in} = 420 \text{ k ohm}$, $C_{gs} = C_{gd} = 1 \text{ PF}$, $g_m = 4 \text{ mA/v}$, $R_i = 3.33 \text{ k ohm}$. Find the mid band gain and upper 3 dB frequency, f_{tt}

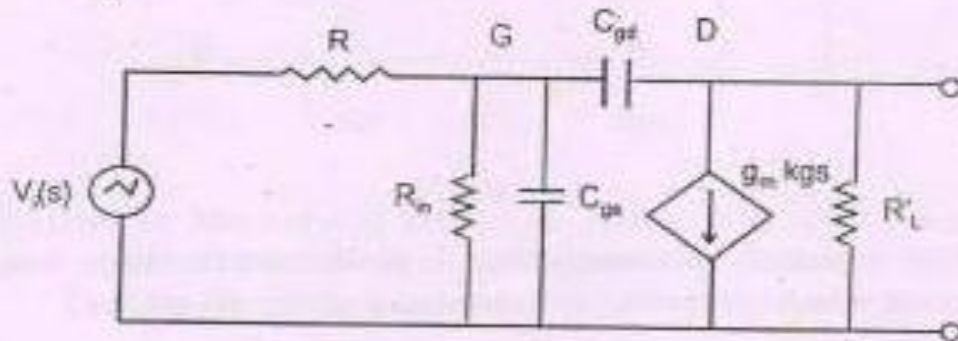


Fig. 4

(or)

13. (b) Draw the small signal equivalent circuit for FET of figure 5 and hence find V_{O1}/v_i and V_{O2}/v_i in terms of circuit constants.

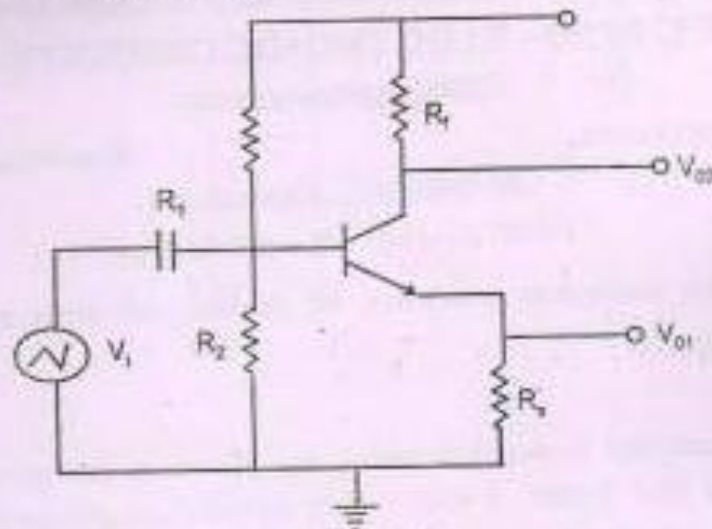


Fig. 5

14. (a) (i) Derive the theoretical maximum conversion efficiency of class B power amplifier.
14. (a) (ii) It is required class B output stage to deliver an average power of 20 Watts to an 8-ohm load. Determine the supply required and the peak current drawn, the efficiency. Transistor rating required

(or)

14. (b) Explain the cross over distortion in class B power amplifier and the methods to minimize the same.
15. (a) With the help of standard circuit components, explain the design and working principle of SMPS. (or)
15. (b) (i) Derive the expression for maximum of version efficiency of Full wave rectifier. Assume the forward resistance of the diode is R_{f1} .
15. (b) (ii) Explain the various techniques of ripple reduction in rectifier circuit.