

ANNA UNIVERSITY COIMBATORE

B.E. / B.Tech. DEGREE EXAMINATIONS – DECEMBER 2008

THIRD SEMESTER - ELECTRONICS & COMMUNICATION ENGG.

EC306 - ELECTRONIC CIRCUITS I

Time: Three Hours

Maximum: 100 Marks

PART A – (20 x 2 = 40 Marks)

Answer ALL Questions

1. Discuss the importance of biasing ?
2. FET is a Unipolar device – justify
3. What is Thermal runaway?
4. Draw the circuit diagram of voltage divider bias ?
5. Calculate the stability factor S for the fixed bias circuit where $R_B=100K\Omega$, $R_C=1 K\Omega$, $V_{CC}=12V$, $V_{CE}=6V$.
6. Give the h Parameter for CB configuration
7. What is the significance of common emitter amplifier?
8. Define CMRR.
9. Compare the various differential mode voltage gain in terms of re.
10. In a class B amplifier $V_{CE}(\min)=1$ volt and the supply voltage $V_{CC}=18V$. Calculate the collector efficiency.
11. Compare Class A, Class B & Class AB power amplifiers
12. What is Slew rate of the differential amplifier?
13. What are the advantages of negative feed back amplifier?
14. What is TUF?
15. Determine the maximum value of heat sink thermal resistance if the data is as follows
(i) power loss in a transistor is 60W (ii) ambient temperature is 45°C max, (iii) maximum junction temperature allowed is 150°C (iv) transistor $\theta_{JC} = 0.5^\circ C/W$.

16. For a regulated DC power supply, the output voltage varies from 12V to 11.6V when the load current is varied from 0 to 100mA which is the maximum value of I_L . If the ac line voltage and temperature are constant, calculate load regulation, % load regulation and output resistance of the power supply.

17. A 9V stabilized voltage supply is required to run a car stereo system from car's 12V battery. A zener diode with $V_z=9V$ and $P_{max}=0.5$ watt is used as a voltage. Find the value of the series resistor R.

18. Draw the diagram of shunt voltage regulator

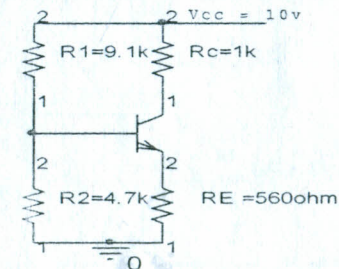
19. For a transistor coupled class A power amplifier, the load resistance is 8Ω and the turns ratio of transformer $[N_1 / N_2] = 64$, calculate the reflected load resistance to the primary side.

20. What is cascade amplifier?

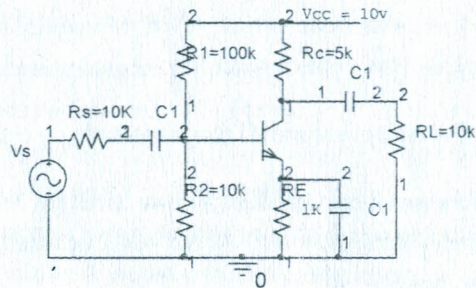
PART B (5 x 12=60 Marks)

Answer Any FIVE Questions

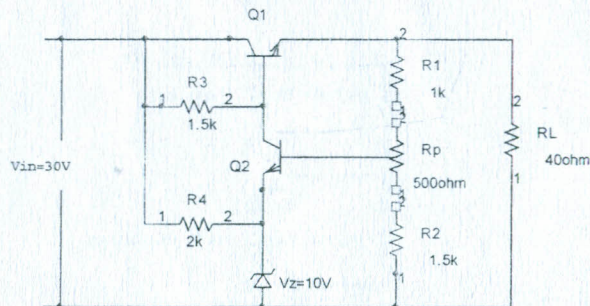
21. Calculate the Q point values OF I_C and V_{CE} for the voltage divider bias circuit shown in fig. Assume that the transistor is a silicon transistor with $\beta=100$.



22. The amplifier shown in fig uses a transistor with the following parameters: $h_{ie} = 1.1K\Omega$, $h_{fe} = 50$, $h_{re} = 2.5 \times 10^{-4}$, $h_{oe} = 25 \times 10^{-6} A/V$. Calculate (i) $A_{is} = I_o / I_i$ (ii) A_v (iii) A_{vs} (iv) R_o and R_i (v) A_r .



23. Discuss the frequency response characteristics of RC coupled amplifiers. Derive the general expressions for gain at low, medium and high frequencies.
24. Show that the maximum rectification efficiency η of a full wave rectifier is 81% also find Ripple factor, PIV, TUF for the same.
25. For a series regulator shown in fig. Q1 and Q2 are silicon transistor with $h_{fe} = 100$ and $V_{BE} = 0.7$. calculate (i) The range over which output voltage can be adjusted (ii) collector current of Q2 (iii) The zener diode current if $V_z = 10V$. for (ii) and (iii) above assume, that output voltage has been adjusted to 20V.



26. With suitable diagram and waveforms explain the operation of a Class B power amplifier using Complementary Symmetry Power Amplifier also mention its advantages and disadvantages.

27. Draw the circuit diagram for a Differential Amplifier using BJT's. Describe Common mode and Difference modes of working.

28. Derive the expressions for Voltage gain, Input impedance, Output impedance for a Voltage divider Common Source FET amplifier.

*****THE END*****