ANNA UNIVERSITY COIMBATORE
B.E. / B.Tech. DEGREE EXAMINATION – DEC 2008
BE (EEE) - THIRD SEMESTER
EE301 – ELECTRONIC CIRCUITS

Time: Three hours **Maximum: 100 marks**

PART A – (20 x 2 = 40 marks)

Answer ALL questions

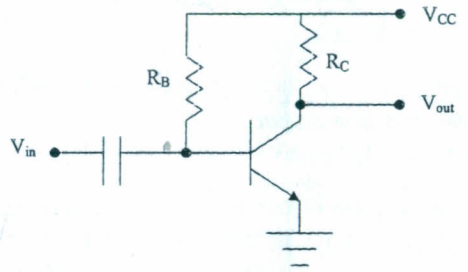
1. What is the need for biasing a transistor?
2. Define stability factor of a transistor amplifier.
3. Draw the small signal model for JFET in CS configuration and define the parameters.
4. Mention the advantages of class B operation as compared with class A operation.
5. A differential amplifier has differential mode gain of 100 and a common mode gain of 0.01. Calculate its CMRR in dB.
6. Give the four differential amplifier configurations. Which is most commonly used and why?
7. Explain the basic operation of tuned amplifier.
8. A single tuned amplifier is used to amplify modulated RF carrier of 600 kHz and BW of 15 kHz. Calculate the effective quality factor.
9. Discuss the effects of negative feedback on distortion and gain.
10. Draw the block schematic of a voltage amplifier with voltage series feedback.
11. State Barkhausen criterion for sustained oscillations.
12. Calculate the oscillator frequency for a Hartley oscillator with C = 500 pF, L_1 = 20 mH, and L_2 = 5 mH.
13. Explain the function of positive clipper.
14. Draw the circuit of a clamper circuit.
15. Mention the applications of astable and monostable multivibrators.
16. Draw the circuit of a UJT oscillator.
17. Compare half-wave and full-wave rectifiers in terms of ripple factor and rectification efficiency.
18. Discuss the importance of the filters in power supplies?

19. Define line regulation and load regulation.
20. Draw the block diagram of SMPS.

PART B – (5 x 12 = 60 marks)

Answer any FIVE questions

21. (a) For the fixed bias transistor amplifier circuit shown in figure, a silicon transistor with β = 100 is used. V_{CC} = 6 V, R_C = 3 kΩ, and R_B = 530 kΩ. Draw the dc load line and determine the operating point. What is the stability factor? (6)



(b) Describe the working of a class B push-pull power amplifier. (6)

22. (a) Draw the circuit diagram of emitter coupled differential amplifier and obtain its a.c. analysis for differential operation. (7)

b) Explain the working of single tuned amplifier with suitable circuit diagram. (5)

23. (a) Show that for a negative voltage-series feedback amplifier the input resistance increases and output resistance decreases with feedback. (7)

(b) A voltage series feedback amplifier has a voltage gain of 500, and input and output resistances of 3 kΩ and 20 kΩ respectively without feedback. Find the gain and input/ output resistances with feedback when 10 % of output is fedback to the input. (5)

24. Draw and explain the operation of an RC phase-shift oscillator. Derive the frequency of oscillation and condition for oscillation. (12)

25. (a) Derive and draw the response of high pass RC circuit to following waveforms:
(i) Step (ii) Pulse (iii) Square (8)

(b) Explain the working of a biased negative clipper. (4)

26.(a) Draw the circuit of fixed bias bistable multivibrator and explain its working with necessary waveforms. (8)

(b) Draw and explain the working of UJT relaxation oscillator. (4)

27.(a) Draw the circuit of a full-wave bridge rectifier and derive expressions for ripple factor and rectification efficiency. (7)

(b) Obtain the ripple factor of a full-wave rectifier with inductor filter. (5)

28. (a) Describe the operation of transistorized shunt regulator. (6)

(b) Discuss the need for cascade connection and Darlington connection of amplifiers with suitable diagrams. (6)

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