

FACULTY OF ENGINEERING

B.E. 2 / 4 (ECE) II Semester (Supplementary) Examination, December 2006

Subject : Analog Electronic Circuits

Time : 3 Hours}

{Max. Marks : 75

Note : Answer All questions of Part – A and Answer any five questions from Part-B. Assume any data if missing.

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PART – A (25 Marks)

1. A negative feedback amplifier has a voltage gain of 60 db and uses 0.1 of the output voltage in the feedback . Calculate the gain with feedback in db. (3)
2. What are the advantages of crystal oscillator ? (2)
3. What are the methods of classification of tuned amplifiers (3)
4. Define (i) Non-linear distortion (ii) Frequency distortion (iii) Phase – shift distortion (3)
5. Define the terms collector dissipation and conversion efficiency. (2)
6. What are the merits and demerits of fixed voltage regulators. (2)
7. What are the advantages of double tuned amplifier ? (2)
8. Write various blocks of voltage series regulator. (3)
9. A FET RC phase shift oscillator circuit uses 3 RC sections in the feedback network containing $R = 10\text{ k}\Omega$, $C = 0.005\mu\text{F}$. Determine the frequency of oscillators. (2)
10. State the advantages of complementary push-pull amplifiers over transformer compled push-pull amplifiers. (3)

PART – B (50 Marks)

11. For the RC phase shift oscillator, briefly explain the operation and derive the expression for frequency of oscillations. (10)
- 12.(a) Derive the expression for the efficiency of class B push pull amplifier. (5)
- (b) Derive the expression for Total harmonic distortion in power amplifiers. (5)
13. A power transistor working as a class A amplifier has a supply voltage of 10 volts. If the maximum change in the collector current in 500 mA, calculate the power transferred to a 8 ohms speaker, when
 - (i) The speaker is directly connected and
 - (ii) Speaker in connected through a 10 : 1 transformer. (10)
14. Discuss the principle of working of staggered tuning RF amplifier. Explain the design details of such an amplifier. (10)

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15. Design a series regulated power supply with the following specifications.

Unregulated input voltage = 30 v and $r_o = 8$ ohms

Regulated output voltage = 12 v, max. load current = 200 mA

Control transistor $h_{fe} = 100, h_{ie} = 200$ ohms

Amplifier transistor $h_{fe} = 200, h_{ie} = 1000$ ohms

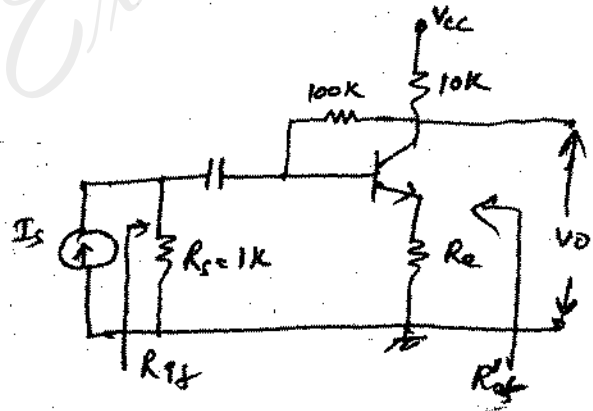
Reference voltage $V_R = 6$ v, Zener resistance = 10Ω

Zener current = 20 mA

Also calculate its stability factor and output resistance.

16. For the transistor feedback amplifier and output figure, $h_{fe} = 150,$
 $h_{ie} = 4.7$ K while h_{ie} and h_{oe} are negligible . Determine with
 $R_e = 1$ K Ω $R_{mf} = V_o/I_s$ (ii) $A_{vf} = V_o/V_s$ (iii) R_{if} (iv) R_{of}

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17. Write short notes on the following :

(a) SMPS

(b) Crystal Oscillators.