



**FACULTY OF ENGINEERING**

**B.E. 2/4 (ECE) II – Semester (Main) Examination, June 2010**

**ANALOG ELECTRONIC CIRCUITS**

Time: 3 Hours]

[Max. Marks: 75

**Instructions :** Answer all questions from Part – A, Answer any five questions from Part – B.



**PART – A**

**(25 Marks)**

1. What are advantages of transformer coupled amplifier over R-C coupled amplifier. 2
2. What is the cross over distortion ? How it can be minimised. 3
3. Explain a feedback amplifier with help of a block diagram. 3
4. An amplifier has a voltage gain of 200 before negative feedback is applied. When negative feedback with  $\beta = 0.25$  is applied. The nominal gain changes by 10% find the percentage change in the overall gain. 2
5. What is a stagger tuned amplifier ? Explain its working. 3
6. A single tuned direct coupled amplifier having  $R_c = 100 \text{ K}\Omega$ ,  $f_0 = 1 \text{ MHz}$ ,  $L = 500 \text{ nH}$ ,  $Q = 50$ ,  $g_m = 1.5 \text{ mA/V}$ . Assume  $r_o$  of the transistor to be very large. Find gain, bandwidth with  $R_L$  connected. 2
7. In RC phase shift  $R = 6 \text{ K}\Omega$ ,  $C = 1500 \text{ PF}$ ,  $R_c = 18 \text{ K}\Omega$  find frequency of oscillation and condition for oscillation intes. 3
8. How are amplifiers classified based on the biasing condition. 2
9. What are the constituent parts of an oscillator. 2
10. Draw the small signal equivalent circuit of FET amplifier in CS connection let  $R_D = 4 \text{ K}\Omega$ ,  $b = 40$ ,  $r_d = 40 \text{ K}\Omega$ . Evaluate to voltage gain. 3



## PART – B

(50 marks)

11. a) Draw the equivalent circuit RC coupled in the mid frequency range and low frequency range. Derive an expression for mid frequency range and low frequency rays for voltage gain. 7
- b) What is Miller effect capacitance ? Explain with example. 3
12. a) Draw the circuit diagram for class B push pull amplifier. Explain its operation. 5
- b) For class 'B' amplifier providing 22 V peak signal to  $8\ \Omega$  load and power supply  $V_{cc} = 25\text{ V}$ . determine : 5
- a) Input power
- b) Output power
- c) Circuit efficiency.
13. a) What is tuned amplifier. Explain the class of tuned amplifiers. 5
- b) Describe the different types of neutralization in details. 5
14. a) Draw the current series feedback amplifier if  $R_c = 1\text{ K}\Omega$ ,  $R_e = 100\ \Omega$ ,  $R_2 = 20\text{ K}\Omega$ ,  $R_1 = 30\text{ K}\Omega$  and  $h_{fe} = 100$  calculate  $A$ ,  $R_i$ ,  $R_{if}$ ,  $A_f$ . 8
- b) How does negative feedback reduces distortion in the amplifier. 2
15. a) Draw the circuit diagram of Hartley oscillator and explain its working. Derive the expression for frequency and condition for starting of oscillation. 7
- b) What are the factors which effect the frequency stability of an oscillator. 3
16. Draw the circuit of tuned class 'C' power amplifier. Explain its operation and derive the expression for output power and collector circuit efficient. 10
17. Short note on : 10
- a) LC oscillator with RC oscillators
- b) Local versus global feedback.