Code No. : 5430/N

FACULTY OF ENGINEERING
B.E. 2/4 (ECE) II Semester (New) (Main) Examination, May/June 2012
ANALOG ELECTRONIC CIRCUITS

Time : 3 Hours] [Max. Marks : 75

Note : *Answer **all** questions from Part **A**.*
*Answer **any five** questions from Part **B**.*

PART – A **(25 Marks)**

1. Voltage gain of a single stage amplifier is 20. Bandwidth = 10 kHz 3 such stages are cascaded. Find overall voltage gain and bandwidth. **3**

2. Draw equivalent circuit of FET at high frequency and explain it. **2**

3. Input and output impedance of an amplifier are 1KΩ and 5KΩ respectively. Gain = 100. Feedback ratio = 0.04. Calculate input and output impedance of a voltage shunt feedback amplifier. **2**

4. Draw equivalent circuit of transconductance amplifier and mention ideal values for R_i and R_o ? **3**

5. Compare series and shunt regulators. **3**

6. Find the oscillation frequency of a colpitts oscillator with circuit valves L = 15.8 mH, $C_1 = 0.16\mu F$, $C_2 = 0.33\mu F$. **2**

7. Classify amplifiers based on the position of Q-point. **2**

8. Differentiate power amplifier and voltage amplifier. **3**

9. List the advantages of tuned circuit. **2**

10. What is meant by neutralization ? Draw two circuits to achieve neutralization and explain. **3**

PART – B 50

11. a) Show the hybrid – π equivalent circuit of BJT at high frequency in CE configuration. Explain significance of each parameter. Derive the expression for f_β and f_T interms of hybrid – π. 8

    b) BJT has the following parameters f_T = 500 MHz at collector current = 1 mA. β=10. Calculate bandwidth. 2

12. Draw current series feedback amplifier and analyse the circuit to calculate A_{If}, A_{vf}, R_{if} and R_{ef} if $R_c = 1K\Omega$, $R_e = 100\Omega$, $C_e = 10\mu F$, $R_s = 100\Omega$, $R_1 = 30K\Omega$, $R_2 = 20K\Omega$, $h_{fe} = 50$ $h_{ie} = 1.1K\Omega$ and $h_{oe} = h_{re} = 0$. 10

13. a) Draw the circuit of Hartley Oscillator and explain its operation. Derive the expression for its frequency of operation and initiating oscillations. 8

    b) Why RC oscillators are not suitable at high frequency ? 2

14. a) Discuss complementary symmetry puss pull class B amplifier and derive the expression for power dissipation. 7

    b) A complementary symmetry providing 22V peak signal to 8Ω load and power supply Vcc = 25V. Find :

    a) input power

    b) output power

    c) circuit efficiency. 3

15. a) What is meant by Synchronous tuning ? Derive the expression for gain and bandwidth. 5

    b) What is stagger tuning ? Draw its frequency response. Derive the expression for selectivity. 5

16. a) When a number of identical Rc coupled amplifiers are connected in cascade derive the expressions for its overall voltage gain, current gain and lower and upper 3dB frequencies ? 5

    b) Prove that –ve feedback reduces gain and increases bandwidth. 5

17. a) Draw transformer coupled class A power amplifier and explain its working. Derive its maximum efficiency. 5

    b) Design a series voltage regulator to provide an o/p of 30V and supply a load 1A. The input varies from 40 to 50 volts. 5