FACULTY OF ENGINEERING

B.E. 2/4 (EE/Inst.) II Semester (Main) Examination, May/June 2011

ELECTRONIC ENGINEERING-II

Time : 3 Hours] [Max. Marks : 75

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

PART – A (Marks : 25)

1. Explain why the CMRR is infinite if a true current constant source is used in a symmetrical emitter-coupled difference amplifier.

2. How does a voltage series negative feedback alter the input and output impedances of an amplifier ?

3. Draw the equivalent circuit of a crystal and define series and parallel resonances of the crystal.

4. Specify the type of components Z_i, Z_o and Z_f for a colpitts oscillator and sketch its circuit diagram.

5. What is meant by operation of amplifiers in Class A, Class B and Class C ?

6. A resistive load of 4 Ω is matched to the collector impedance of an amplifier by means of a transformer having turns ratio of 40 : 1. What is the reflected impedance ?

7. Define rise time and delay time of a low pass filter for a step input.

8. What is meant by linear wave shaping ?

9. A difference amplifier has a CMRR of $60d_B$ and $A_d = 1000$. Find A_C in dB.

10. In a BJT self bias circuit, which type of negative feedback is used ? Justify.

PART – B (Marks : 50)

11. (a) Derive the equation for A_f, the gain with feedback, for a negative feedback amplifier.

    (b) Explain clearly how negative feedback effects the amplifier input and output impedances and derive R_{if} for shunt input connection.

12. (a) Derive an expression for frequency of oscillations of an RC phase shift oscillator and justify the Barkhausen conditions in this case.

(b) Find C and h_{fe} of a transistor to provide f_o of 50 KHz of a RC transistorized phase shift oscillator. Given R_1 = 22 KΩ,. R_2 = 68 KΩ, R_C = 20 KΩ, R = 6.8 KΩ and h_{ie} = 2 KΩ.

13. (a) Define A_C, A_D and CMRR of a difference amplifier.

(b) A difference amplifier has inputs V_{S1} = 10 mV, V_{S2} = 9 mV. If it has A_D = 60 dB and CMRR = 80 dB, find the percentage error in the output and the error voltage.

14. (a) Show that the output of a push pull amplifier does not contain even harmonics.

(b) If an amplifier draws 800 mA from a 10 V d.c. supply and delivers 6 Watts of audio power to a loud speaker, calculate : (i) d.c. power (ii) collector power dissipation (iii) conversion efficiency.

15. (a) Draw the response of the following circuit to the input given. Is it a differentiator or an integrator ? Why ?
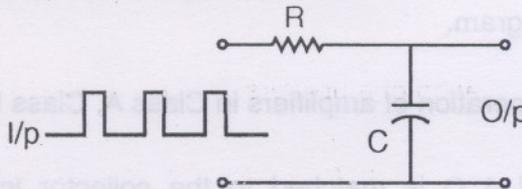
(b) Justify why a clamping circuit is called a d.c. restorer.

(c) What is a clipper ? Discuss.

16. (a) What is cross over distortion in power amplifiers ?

(b) What is frequency stability with respect to oscillators ?

17. Write notes on any **two** :

(a) Drift compensation techniques

(b) Complementary symmetry amplifier

(c) Effect of feedback on noise of an amplifier