Analog Electronics
(EC-202, Dec-05)

Note: Section A is compulsory. Attempt any four questions from section-B and any two from Section-C.

Section-A
1. a) Draw the high frequency equivalent circuit of CE transistor.
   b) Why does the O/P stage employ push-pull arrangement?
   c) Why do we use transformer in the O/P stage of an amplifier?
   d) What is stagger tuning? Explain in brief.
   e) What do you understand by multi-stage transistor amplifier? Mention its need.
   f) How does –ve feedback increase bandwidth of an amplifier?
   g) Why do you use three RC sections in RC phase shift oscillator?
   h) Why is crystal oscillator used in radio transmitter?
   i) What is the practical importance of voltage regulation I power supplier?
   j) What are the limitations of transistorized power supplies?

Section-B
2. Explain the hybrid pi CE model in detail.
3. Show that maximum collector efficiency of class A transformer coupled power amplifier is 50%.
4. A power transistor working in class A operation has zero signal power dissipation of 10 Watts. If the a.c. output power is 4 watts, find
   (i) Collector efficiency (ii) power rating of the transistor.
5. Calculate the gain of a –ve feedback amplifier with an internal gain $A_V = 75$ and feedback fraction $m_v = 1/15$. What will be the gain if A_V doubles?
6. Explain the current series feedback circuit in detail with a neat diagram and perform a suitable analysis.

Section-C
7. Explain transistor RC coupled amplifier with special reference to frequency response, advantages, disadvantages and applications.
8. (a) Explain the circuit of Hartley Oscillator in detail.
   (b) A zener diode regulate has $v_Z = 12$ V. The input voltage may vary from 20 to 35 V and load current from 15 to 75 Ma. To hold load voltage constant under all conditions, what should be the value of series resistance?
9. (a) A class A power amplifier has a transformer as the load. If the transformer has a turn ratio of 10 and the secondary load is 100Ω, find the maximum a.c. power output. Given that zero signal collector current is 100m A.
   (b) Write a short note on transistor series and shunt regulators.