C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name: Linear Electronics

Subject Code: 4TE03LNE1   **Branch: B.Tech (CE)**

Semester: 3   Date:5/12/2015   Time:2:30 To 5:30   Marks :70

Instructions:
    (1) Use of Programmable calculator & any other electronic instrument is prohibited.
    (2) Instructions written on main answer book are strictly to be obeyed.
    (3) Draw neat diagrams and figures (if necessary) at right places.
    (4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   **(14)**

    a) Why are the h parameters preferred to analyze a circuit using BJT?
    b) Why is a hybrid model of transistor preferred over other models?
    c) What is the use of class C amplifiers?
    d) Why is a power amplifier called large signal amplifier?
    e) What are the practical applications of emitter follower?
    f) What is the effect of negative feedback on bandwidth of an amplifier?
    g) What will be the output shape of an op-amp differentiator with sinusoidal and square wave input?
    h) What will be the output shape of an op-amp integrator with sinusoidal and square wave input?
    i) What are the applications of op-amp integrators?
    j) Why is an emitter follower called so?
    k) What are the different types of feedback?
    l) What do you understand by feedback in an amplifier?
    m) Why do we use transformer in the output stage of power amplifier?
    n) Give the differences between voltage and power amplifiers.

Attempt any four questions from Q-2 to Q-8

Q-2   **Attempt all questions**   **(14)**
    (a) Draw the h-parameter equivalent circuit of Common Emitter Amplifier circuit and derive the expression for input impedance, output impedance, voltage gain and current gain.
    (b) Show that maximum collector efficiency of class A transformer coupled power amplifier is 50%.

Q-3   **Attempt all questions**   **(14)**
- **(a)** Explain with a diagram, the working of a transformer coupled class AB power amplifier.
- **(b)** Derive an expression for the voltage gain of a Non-Inverting Op-Amp.

Q-4   **Attempt all questions**   **(14)**
- **(a)** Explain the working of Class B transformer coupled push-pull amplifier and derive the expression for its efficiency.
- **(b)** Derive an expression for the voltage gain of an Inverting Op-Amp.

Q-5   **Attempt all questions**   **(14)**
- **(a)** Draw the block schematic of an op-amp and explain the function of each stage.
- **(b)** Deduce the Barkausen Criterion for the generation of sustained oscillations. How are the oscillations initiated?

Q-6   **Attempt all questions**   **(14)**
- **(a)** With neat circuit diagram, explain RC phase shift oscillator.
- **(b)** Draw and explain Voltage Series Feedback amplifier.

Q-7   **Attempt all questions**   **(14)**
- **(a)** Draw and explain Current Shunt Feedback amplifier.
- **(b)** Write short note on Hartley's Oscillator.

Q-8   **Attempt all questions**   **(14)**
- **(a)** Explain with the help of circuit diagram the working of Colpitts Oscillator.
- **(b)** Explain how can an op-amp be configured as an adder. Obtain the output expression.