10ES32 - Analog Electronic Circuits

Assignment-III

Note: i) Write the assignment in a A4 size paper
          iii) Mention your USN, name and section on the top right corner of first page
          iii) Assume the missing data suitably
          iv) Submit the assignment on or before 11.00 AM, Friday, 8/11/2013

1. What is harmonic distortion? Derive an expression for second harmonic distortion.
2. Derive an expression for THD and total power output.
3. A transistor supplies 0.85W to a 4KΩ load. The zero signal DC collector current is 31mA and the dc collector current with signal is 34mA. Determine the second harmonic distortion.
4. Calculate the harmonic distortion components and the total harmonic distortion for an output signal having fundamental amplitude of 3V, second harmonic amplitude of 0.3V, third harmonic amplitude of 0.15V and fourth harmonic amplitude of 0.06V. Also find the power delivered by the fundamental component of output voltage if R_L=15Ω.
5. Prove that the conversion efficiency of Class-B push-pull power amplifier is 78%.
6. Prove that the conversion efficiency of Transformer coupled Class-A power amplifier is 50%.
7. A transformer coupled Class-A power amplifier drives a load of 8Ω through a 3:1 transformer. With V_{CC}= 24V, the circuit delivers 2W to the load. The transformer efficiency is 80%. Find, i) power across the transformer primary, ii) rms voltage across load and transformer primary, iii) rms values of load current and primary current, iv) conversion efficiency if DC collector current is 260ma.
8. With suitable circuit diagrams, explain the effect of C_E on low frequency response and voltage gain.
9. Explain Miller effect capacitance.
10. Explain the effect of Input Capacitance C_i on the upper cut-off frequency.