Tutorial 8

UEC 301: Analog Electronic Circuits

Q1. Prove that the power output of a class-A power amplifier is given by

$$P = \frac{(V_{max} - V_{min})(I_{max} - I_{min})}{8}$$

Q2. If the instantaneous total current in collector circuit is given by following expression then, determine the expression of second harmonic distortion D2 in terms of B2 and B1.

$$i_C = I_C + B_0 + B_1 Cos(wt) + B_2 Cos(2wt)$$

Q3. If the instantaneous AC current in collector circuit is given by following expression then, obtain the expression for the second harmonic distortion D2 in terms of G_1, G_2, and I_{bm}.

$$i_c = G_1 i_b + G_2 i_b^2$$

$$where, i_b = I_{bm} Cos(wt)$$

Q4. A transistor amplifier supplies 5 mW to a 100-ohm load. Its dc collector current is 12 mA. If the second harmonic distortion must stay within 10%, determine the peak collector current allowed in the transistor.

Q5. Derive the expression of maximum efficiency of series fed and transformer coupled class-A power amplifier.

Q6. How push pull amplifier balanced out even harmonic? Explain with the help of circuit diagram and mathematical analysis.

Solution

Refer chapter 18 (Power circuits and systems) of Millman's Integrated Electronics for all questions.