Please check whether you have got the right question paper

N.B: 1. Question No.1 is compulsory.
2. Attempt any three questions from remaining.
3. All questions carry equal marks.
4. Assume suitable data wherever necessary.

1. Attempt any four of the following

(a) Draw general frequency response of an amplifier. Determine corner frequencies for the following.

(b) Compare MOSFET diffamp with passive load and active load.

(c) Calculate max power dissipation with and without heat sink.

\[ \theta_C = 1.5^\circ\text{C}/\text{W}, \theta_{CS} = 1^\circ\text{C}/\text{W}, \theta_{CA} = 50^\circ\text{C}/\text{W} \]

\[ \theta_J = 4^\circ\text{C}/\text{W}, T_{max} = 100^\circ\text{C}, T_{Amb} = 25^\circ\text{C} \]

(d) State and explain Barkhausen criteria.

(e) Explain working of SCR. Define \( I_L \) and \( I_{H} \).

2. (a) Determine voltage gain, i/p and o/p impedance for the two stage amplifier shown below.

Assume \( V_{BE} = 0.7\text{V}, \, B_1 = B_2 = 150 \)
(b) Explain working of RC phase shift oscillator. Give expression for frequency of oscillations.

3. (a) Draw block diagram of voltage series negative feedback. Derive formulae for $A_v$, $R_{if}$, $R_{of}$.

(b) Explain working of UJT with the help of characteristics. Hence explain relaxation oscillator.

4. (a) Determine $I_{DQ}$, $V_{GSQ}$ and differential mode gain for following circuit. Assume $K_n = 0.15 \text{ mA/v}^2$, $(V_A) = 100 \text{ V}$ $VT = 1.5 \text{ V}$.

(b) Draw circuit diagram of class A Transformer coupled amplifier. Explain working, Draw AC/DC load line. Derive expression of efficiency.

5. (a) Explain high frequency response of CS-MOSFET amplifier with proper equation. Discuss effects of parasitic capacitances.

(b) Explain use of constant current source in Diff amps. Give description of any one type.

6. Solve (Any Three)

   (1) Cascode Amplifier working
   (2) Gunn diode and it’s applications
   (3) Crossover distortion and methods to remove in class B amplifier
   (4) Hartley oscillator.

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