

Duration: 3Hrs.

Max Marks:80

- N.B. :** (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

- 1 Attempt any Four. [20]**
- Compare voltage amplifier and power amplifier
 - Explain crossover distortion with neat sketch
 - Write a short note on current mirror circuit
 - Draw block diagram of oscillator. State and explain Barkhausens criteria
 - Compare all four types of negative feedback amplifiers.
- 2 a Explain what is a multistage amplifier? Explain the different types of coupling methods. [10]**
- b Write a short note on FET Cascode amplifier (CS-CG). [10]**
- 3 a Explain different ideal feedback topologies for a negative feedback amplifier using block diagram. [10]**
- b Explain working of RC phase shift oscillator with the help of circuit diagram. Give expression for frequency of oscillations. [10]**
- 4 a What are the different methods to improve CMRR. Explain any one. [10]**
- b Explain Class-A power amplifier. Drive expression for its efficiency. [10]**
- 5 a Determine the lower cut off frequency due to the effect of coupling and bypass capacitors for an amplifier in figure 1 with the following specifications: $V_{cc} = 20V$, $R_1 = 40K\Omega$, $R_2 = 10K\Omega$, $R_c = 4K\Omega$, $R_E = 2K\Omega$, $R_L = 2.2K\Omega$, $CC1 = 10\mu F$, $CC2 = 1\mu F$, $C_E = 20\mu F$, Assume $r_o = \infty$ and $\beta = 100$ [10]**

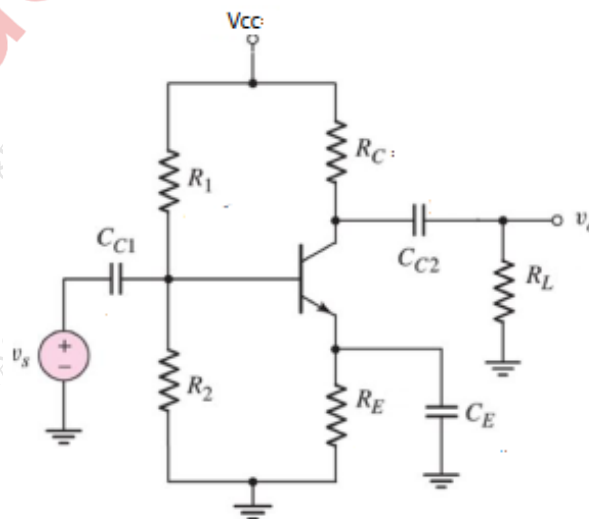


Figure. 1

- b Write a short note on types of coupling used in multistage amplifiers [10]**

- 6 a For the differential amplifier in Figure 2, the parameters are: $V^+ = 5\text{ V}$, $V^- = -5\text{ V}$, $R_1 = 80\text{ k}\Omega$, and $R_D = 40\text{ k}\Omega$. The transistor parameters are $\lambda = 0$ and $V_{TN} = 0.8\text{ V}$ for all transistors, and $K_{n3} = K_{n4} = 100\mu\text{A}/\text{V}^2$ and $K_{n1} = K_{n2} = 50\mu\text{A}/\text{V}^2$. Determine the range of the common-mode input voltage. [10]

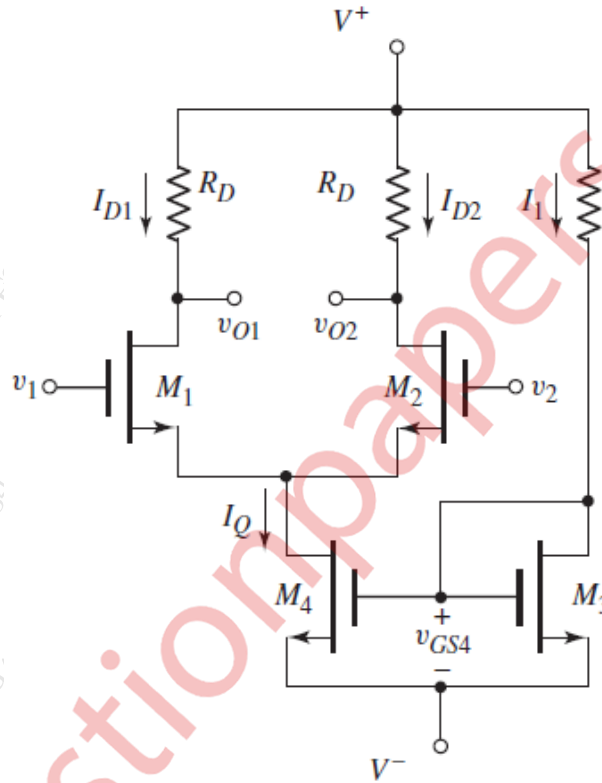


Figure 2.

- b Calculate the input power, output power and efficiency of the amplifier circuit in the figure for an input voltage that results in base current of 10mA peak. [10]

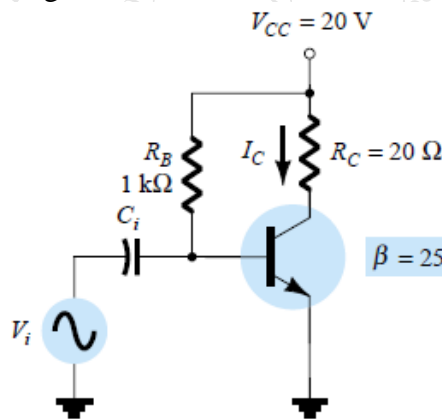


Figure. 3
