

Day: Saturday
Date: 25/05/2019

S-2019-2613

Time: 10.00 AM TO 01.00 PM
Max Marks. 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data, if necessary.

- Q.1** a) Discuss briefly the choice of transistor configuration in a cascade amplifier. (04)
- b) Compare the three types of coupling methods used in multistage amplifiers (06)

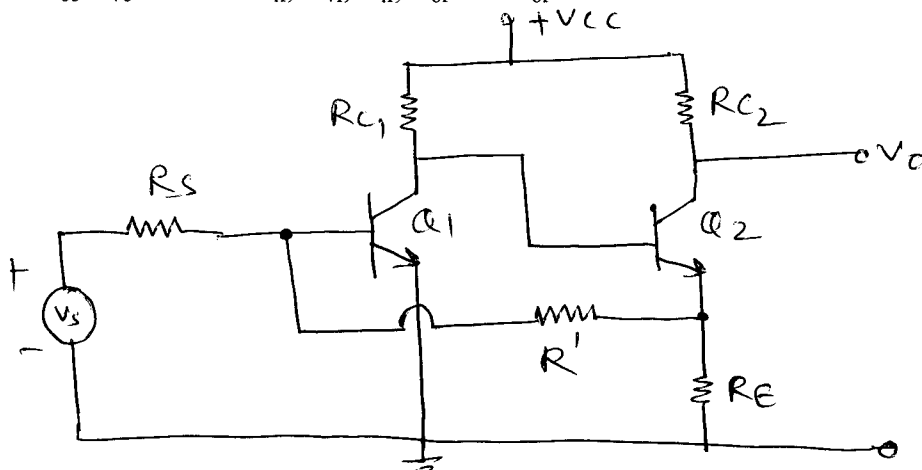
OR

- Q.1** The cascode amplifier makes use of identical transistors Q1 and Q2 with the following h parameters: $h_{fe}=100, h_{ie}=1.1\text{K}\Omega, h_{oe}=5 \times 10^{-6} \text{ mhos}, h_{re}=2 \times 10^{-4}$. The circuit parameters are $R_s=1\text{K}\Omega, R_3=100\text{K}\Omega, R_4=10\text{K}\Omega$ and $R_L=2\text{K}\Omega$. Calculate the overall current gain, voltage gain, input and output resistances. (10)

- Q.2** Give reason: (10)
- i) Output impedance of a voltage series feedback amplifier is lower than the output impedance of that amplifier without the feedback.
 - ii) Negative feedback in an amplifier stabilizes its gain.
 - iii) Input impedance of a current series feedback amplifier is larger than the input impedance of that amplifier without the feedback.

OR

- Q.2** The circuit of the figure has the following parameters: $R_{C1}=2\text{K}\Omega, R_{C2}=1\text{K}\Omega, R'=R_S=1.2\text{K}\Omega, R_E=100\Omega, h_{ie}=2.2\text{K}\Omega, h_{fe}=100$ and $h_{oe}=h_{re}=0$. Find $A_{if}, A_{vf}, R_{if}, R_{of}$ and R_{of}' . (10)

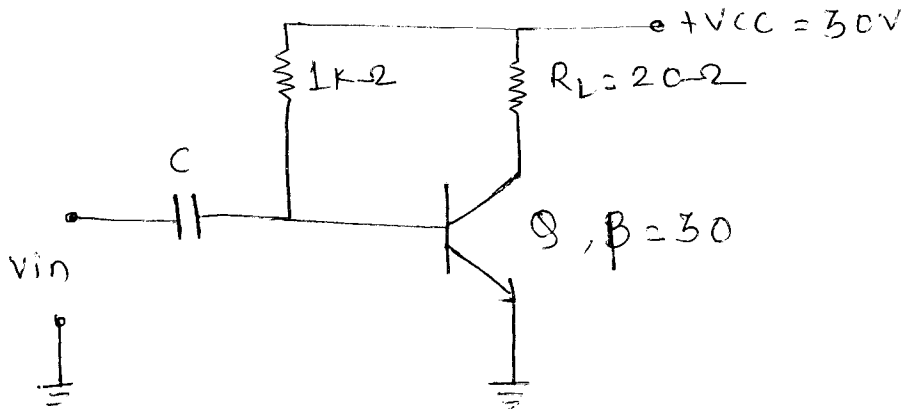


- Q.3** a) Discuss three point method of computing harmonic distortion. (06)
- b) Show that the maximum efficiency of class B operation will not exceed 78.5%. (04)

OR

P.T.O.

- Q.3** For a series fed class A amplifier show in the figure the a.c. input signal causes a base current swing of 7mA peak. Calculate: (10)
- i) Q point ii) D.C. input power iii) A.C. output power
 iv) Efficiency v) Power dissipation



- Q.4** Draw the circuit diagram of transistorized Colpitts oscillator and describe its working. Derive expression for frequency of oscillation. What is the modification done in Colpitt oscillator to achieve frequency stability? (10)

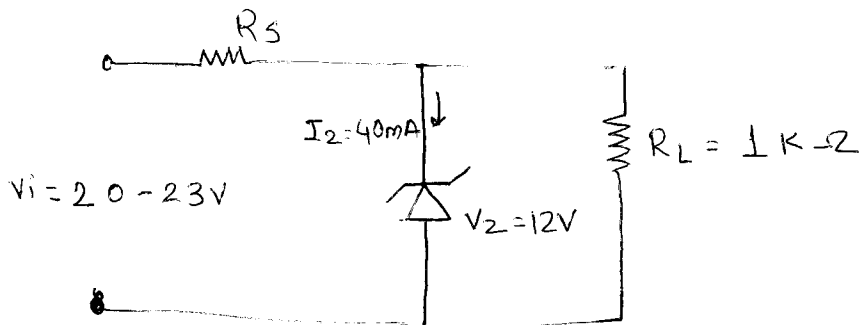
OR

- Q.4 a)** A Hartley oscillator is found to oscillate at 2MHz. The oscillator uses a capacitor of 1nF in tuned circuit. If one of the inductors in tuned circuit is $10\mu H$, find the value of other inductor. (05)
- b)** A tuned collector oscillator has a fixed inductance of 1mH and has to be tunable over the frequency band of 540KHz to 1650KHz. Find the range of variable capacitor to be used. (05)

- Q.5** List the important features of IC723 regulator. Describe the internal structure of IC 723 with the help of its functional block diagram. (10)

OR

- Q.5** For zener regulator circuit shown in the figure find: (10)
- i) Value of R_S ii) Load current I_L iii) Power dissipation rating of zener



- Q.6** Derive the expressions for hybrid- π parameters of transistor in terms of CE h-parameters. (10)

OR

- Q.6** Given the following transistor measurements made at $I_C = 4mA$, $V_{CE} = 12V$ and at room temperature, $h_{fe} = 100$, $h_{ie} = 600\Omega$, $A_i = 20$ at 20 MHz, $C_e = 3pF$. Find f_β , f_T , C_e , $r_{b'e}$ and $r_{bb'}$. (10)

* * * * *