Code No: R07A1EC06 **R07**

I B.Tech Examinations,May/June 2012
ELECTRONIC DEVICES AND CIRCUITS
Common to BME, IT, ICE, E.COMP.E, ETM, E.CONT.E, EIE, CSE, ECE, CSSE

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Derive the expressions for voltage gain, current gain, I/P impedance, O/P impedance of CE amplifier, using exact & approximate model. [16]

2. Derive the ripple factor of capacitor filter. [16]

3. (a) Write the reason why the Ico value is negative for NPN transistor & Ico value is positive for NPN transistor.
   (b) Define base spreading reisitance. [10+6]

4. An infinitely large parallel plane plates are spaced 0.8 cm apart. The voltage on one of the plates is raised from 0 to 5 V in 1 ns at a uniform rate with respect to the other. After this duration, the potential difference between the plates is suddenly dropped to 0 V and remains the same thereafter. Find:
   (a) The position of the electron, which started with zero initial velocity from the negative plate, when the potential difference drops to zero volt,
   (b) The total time of transit of the electron from the cathode to the anode. [16]

5. (a) With a neat circuit diagram, explain the principle of operation of a RC phase shift oscillator using FET.
   (b) What are the differences between RC phase shift oscillator & wein bridge oscillator? [12+4]

6. The current series feedback type of transistor amplifier of figure 6 has the following data of circuit constant: $R_L = 1$ k Ω , $R_e = 100$ Ω, $R_2 = 20$ k Ω, $R_s = 600$ Ω, $R_L = 1$ k Ω, $h_{fe} = 100$ and $h_{ie} = 100$, calculate a_1, A_{fe}, R_{if}, and loop gain in dB.[16]

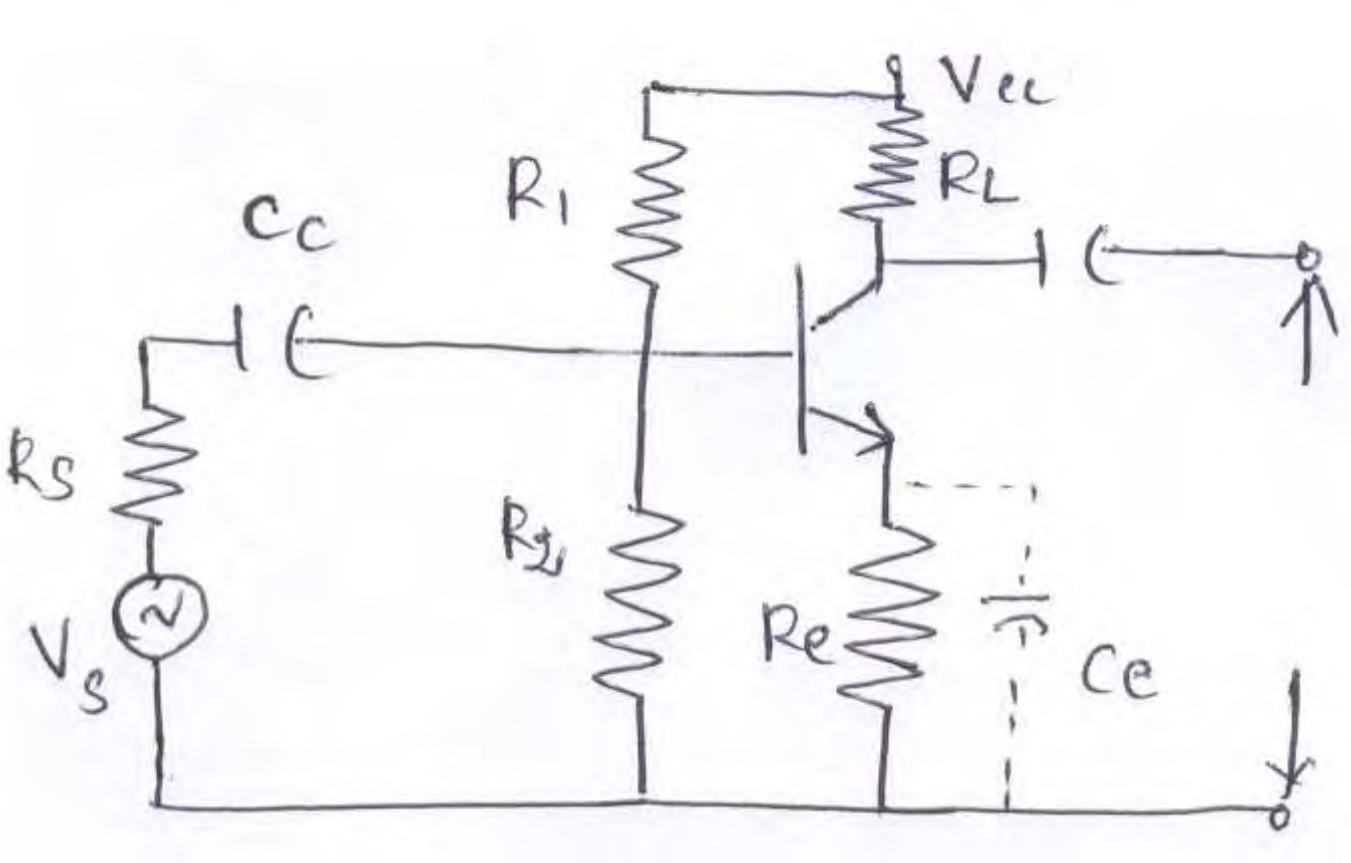

Figure 6

7. Calculate the values of R_1, R_2 & R_C in the voltage divider bias circuit so that Q-point is atr $V_{CE} = 6$ Vand $I_C = 2$ mA. Assume the transistor parameters are : $\alpha = 0.985$, $I_{CBO} = 4$ μA and $V_{BE} = 0.2$ V. [16]

8. (a) Write short notes on photo diode.
   (b) Explain the concept and effect of dark current. [10+6]

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