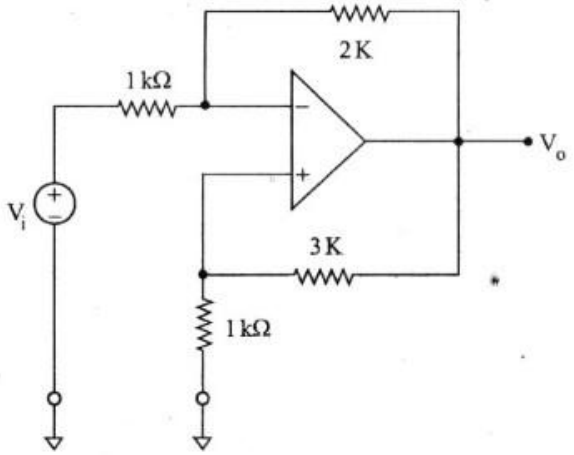
Unit - V

5. a) List the characteristics of an ideal Op-Amp.
   b) Discuss about the unity gain bandwidth and the open loop gain versus frequency curve.
   c) Draw the circuit of adder or summing amplifier using Op-Amp and explain its operation.
   d) Explain instrumentation Amplifier using Op-Amp with the aid of diagram.

OR

For the circuit shown in figure determine the gain V_o/V_i. Assume Op-Amp to be ideal.



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Roll No .....

EC - 404

B.E. IV Semester

Examination, December 2015

Electronics Circuits

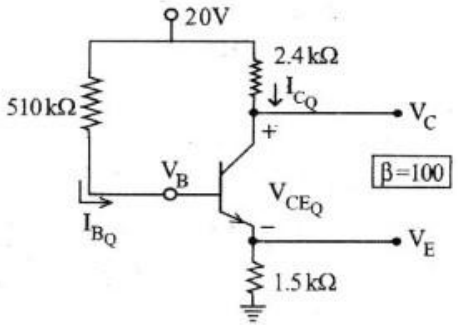
Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Explain the concept of Load Line.
   b) What is Miller Capacitance? Explain its effect on voltage gain.
   c) Explain High Frequency Model (hybrid-π) for BJT.
   d) For the emitter-stabilized bias circuit of given figure. Determine :
      i) I_{B_Q}
      ii) I_{C_Q}
      iii) V_{CE_Q}
      iv) V_C
      v) V_B
      vi) V_E



OR

Calculate the current and voltage gains of a CE amplifier having the following parameters.

$h_{ie} = 1100\ k\Omega$, $h_{re} = 2.5\times10^{-4}$, $h_{fe} = 50$,

$h_{oe} = 25\times10^{-6}$ mho, $R_S = 1k\Omega$, $R_L = 1\ k\Omega$.

Unit - II

2. a) What is the effect of negative feedback on gain stability?

   b) Explain the Barkhausen criterion for oscillators.

   c) Explain the types of negative feedback with circuit diagram.

   d) Sketch the circuit of RC phase shift oscillator. Explain its working and determine its frequency of oscillation.

OR

Draw the circuit of a Wien bridge oscillator. Discuss its working. Wall oscillation take place if bridge is balanced? Explain.

Unit - III

3. a) How power amplifiers are classified? Explain.

   b) Draw a circuit diagram of a classA amplifier and explain its operation.

   c) Draw the circuit of a push pull amplifier using complementary symmetry without transformer and discuss its working.

   d) Draw and explain the circuit diagram for a common-base amplifier using a coupled-circuit load with both primary and secondary winding tuned. Sketch and explain the gain/frequency response for various degrees of coupling.

OR

Write equations for a class B transformer-coupled amplifier for dc input power to the output stage, ac power delivered to the transformer primary, and circuit efficiency. Show that the maximum theoretical efficiency of a class B amplifier is 78.6%.

Unit - IV

4. a) What is the effect of cascading on bandwidth?

   b) Write down the expression of gain and impedances in Darlington connection.

   c) Explain the bootstrapping technique.

   d) The following specifications are given for the dual input balanced output differential amplifier :

   $R_C = 2.2\ k\Omega$, $R_E = 4.7\ k\Omega$, $R_{in1} = R_{in\,2} = 50\Omega$,

   $V_{CC} = +10V$, $V_{EE} = -10V$. The transistors have $\beta_{dc} = \beta_{ac} = 100$ and $V_{BE} = 0.715V$.

   i) Determine I_{C_Q} and V_{CE_Q} values.

   ii) Determine the voltage gain.

   iii) Determine the input and output resistances.

OR

Sketch the circuit of a two-stage direct coupled common-emitter amplifier using npn BJT. Discuss the advantage of direct coupling between stages.