

Unit - VRoll No. rgpvonline.com**EC - 404****B.E. IV Semester**

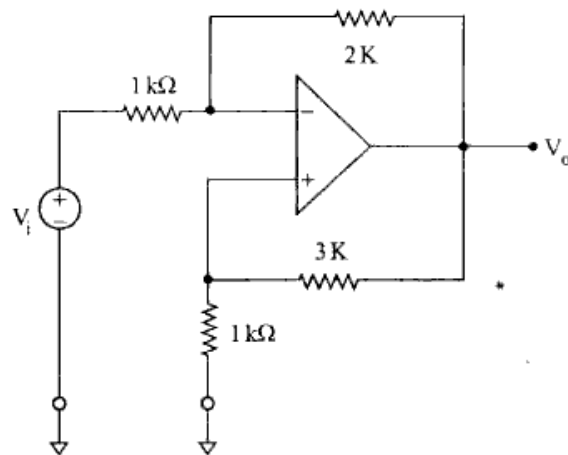
Examination, December 2015

Electronics Circuits**Time : Three Hours****Maximum Marks : 70**

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. rgpvonline.com
 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.



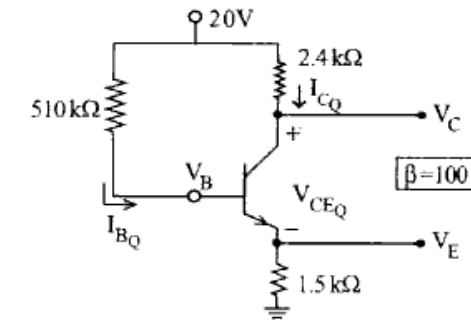
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- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max. 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_{BQ}
 ii) I_{CQ}
 iii) V_{CEQ}
 iv) V_C
 v) V_B
 vi) V_E



[2]

OR

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

$$h_{ie} = 1100 \text{ k}\Omega, h_{re} = 2.5 \times 10^{-4}, h_{fe} = 50, \\ h_{oe} = 25 \times 10^{-6} \text{ mho}, R_S = 1 \text{ k}\Omega, R_L = 1 \text{ k}\Omega.$$

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. Will 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 class A amplifier and explain its operation. rgpvonline.com
- 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.

[3]

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 :

$$R_C = 2.2 \text{ k}\Omega, R_E = 4.7 \text{ k}\Omega, R_{in1} = R_{in2} = 50 \Omega,$$

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

- i) Determine I_{CQ} and V_{CEQ} values.
- ii) Determine the voltage gain. rgpvonline.com
- 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.