Roll No ....

EC-404 (Old)
B.E. IV Semester
Examination, June 2016
Electronics Circuits

Time : Three Hours

Maximum Marks : 70

ote: 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.

a) Draw the single stage self-biased circuits using pnp transistor.

b) Draw the low frequency hybrid equivalent. Circuit for CE amplifier.

c) Give the advantages of h-parameter analysis.

d) A CB amplifier is driven by a voltage source of internal resistance Rs = 1k. The load impedance is RL = 1K. The transistor parameters are h_{ib} = 22, h_{fb} = −0.98, h_{rb} = 2.9 × 10^{-4}, h_{ob} = 0.5μA/V. Compute current gain, voltage gain, input and output impedance of the amplifier.

OR

Draw the small-signal equivalent circuit for an emitter follower stage at high frequencies and obtain the voltage gain.

2. a) Write the expression for input and output resistance of voltage series feedback amplifier.

   b) State the Barkhausen criteria for sustained oscillations or state the condition for maintaining oscillations.

   c) Draw the equivalent circuit of crystal oscillator.

   d) Explain voltage shunt feedback amplifiers.

OR

   Explain Hartley oscillator and derive the equation for oscillation.

3. a) What is the need for neutralization circuit?

   b) What are the advantages of tuned amplifiers?

   c) Differentiate between single, double and straggled tuned amplifier.

   d) Draw the circuit diagram of a class B push-pull power amplifier using transformer coupled input and derive its efficiency.

OR

   Draw the circuit of a single tuned amplifier and derive expression for gain as a function of frequency.

   a) Define differential and common mode gain.

   b) Draw the circuit diagram of constant current source.

   c) With a neat diagram, explain the operation of Darlington Amplifier.

   d) Discuss the effect of bandwidth on cascading single tuned amplifiers.

OR

   Draw the circuit of bootstrap voltage time base generator and explain the quiescent conditions, formation of sweep, retrace interval and recovery process.

5. a) Draw circuit diagram of basic differentiator using Op-Amp.

   b) What are the characteristics of an ideal Op-Amp?

   c) Define output offset voltage. Describe how offset nulling is achieved in Op-Amp.

   d) Design and draw Op-Amp based circuit for following operation, figure.
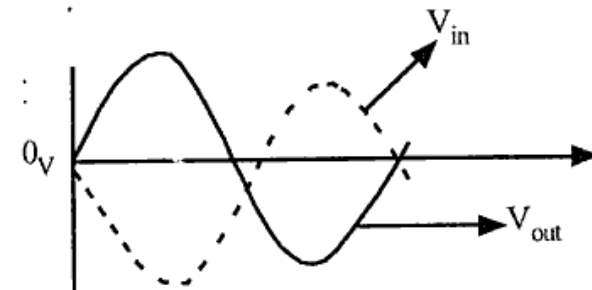
OR

   Describe the operation of Op-Amp based Schmitt trigger for sine to square wave conversion with the help of it's circuit diagram.

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