Total No. of Questions : 5] [Total No. of Printed Pages : 4

Roll No. 05502EC091051

EC–404(N)

B. E. (Fourth Semester)
EXAMINATION, June, 2011
(Electronics & Communication Engg. Branch)
ELECTRONIC CIRCUITS
[EC–404(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. Internal choice is given in each question. Attempt *one* question from each Unit.

Unit–I

1. (a) Fig. 1 shows the circuit of fixed bias using a silicon transistor with $\beta = 100$. Determine : 10

(i) Base current
(ii) Collector current
(iii) V_C, V_B and V_{CB}
(iv) Operating point and
(v) Stability factor

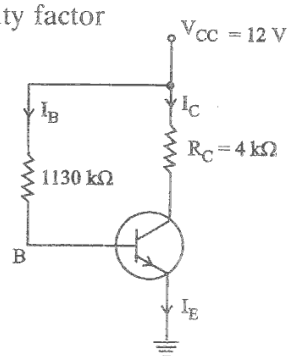

Fig. 1

P. T. O.

(b) Discuss the need for biasing a transistor. Derive an expression for stability factor. 10

Or

(a) Draw the circuit of a CE transistor configuration and give its h-parameter model. 10

(b) Derive the expression for the CE short-circuit current gain A_i as a function of frequency. 10

Unit – II

2. (a) Draw the block diagram of feedback amplifier and state its each block function. 10

(b) Explain voltage shunt feedback amplifier. 10

Or

(a) The circuit of Fig. 2 is to have an overall trans-conductance gain of -1 mA/V, a voltage gain of -4 and a desensitivity of 50. If $R_s = 1$ K, $h_{fe} = 150$ and r_{bb} is negligible, find (i) R_e (ii) R_L (iii) R_{if} and (iv) The quiescent collector current I_C at room temperature 10

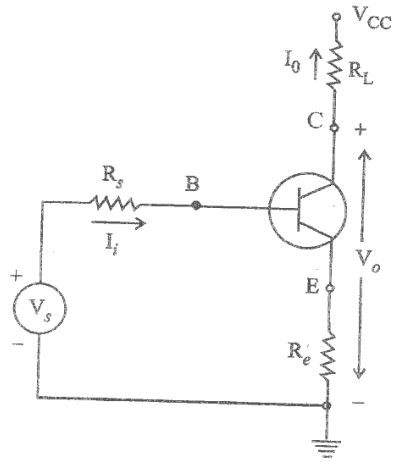

Fig. 2

(b) Explain the effect of negative feedback on gain stability. 10

Unit – III

3. (a) Differentiate between voltage and power amplifiers. Give the classification of power amplifiers and the use of each class. 10

(b) Draw the circuit of a simple class A amplifier which can provide power amplification and explain its working. 10

Or

(a) Explain in brief the advantages of using double tuned circuit over a single tuned circuit. 10

(b) In a class C tuned amplifier circuit shown in Fig. 3, $C = 600\,pF$ and the coil has $L = 25\,\mu H$ and $R = 20\,\Omega$ and $R_L = 2\,M\,\Omega$. Determine resonant frequency, dc load, a. c. load and quality factor of the circuit. 10

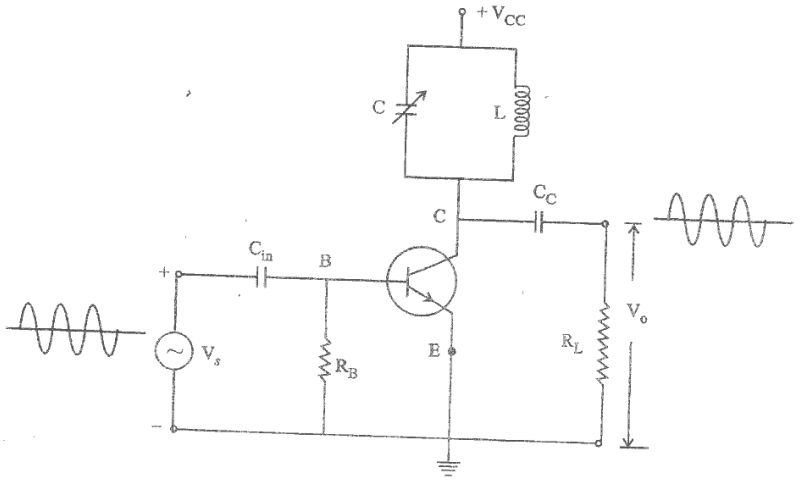

Fig. 3

Unit – IV

4. (a) What is differential amplifier ? Why are they preferred over single-ended amplifiers ? 10

(b) Describe the workings of current mirror circuit with diagram. 10

Or

Give d. c. and a. c. analysis of dual input, balanced output differential amplifier and derive expressions of the operating current and voltage, input and output resistances and voltage gain. 20

Unit – V

5. (a) Explain the block diagram of an operational amplifier and explain the function of each block. 10

(b) Discuss the characteristics of an ideal operational amplifier. Draw the equivalent circuit of an Op-Amp. 10

Or

(a) Explain the open-loop Op-Amp. configurations in detail. 10

(b) (i) Define slew rate. 5

(ii) Determine input bias current and input offset current if $I_{B1} = 10\mu$ A and $I_{B2} = 7{\cdot}5\mu$ A. 5