Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE/EIE) (Sem.–4)

ANALOG ELECTRONICS/APPLIED ELECTRONICS

Subject Code : EC-202

Paper ID : [A0306]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

1) Write briefly :

a) State Barkhausen's Criteria for Oscillation.

b) Define I_{CBO} and I_{CEO}. How are they different? How are they related? Are they typically close in magnitude?

c) Define α_{dc} and α_{ac}. Find I_E if $I_B = 40\ \mu A$ and α_{dc} is 0.98.

d) What are the factors responsible for reduction in gain at high frequencies?

e) Define noise figure for an amplifier.

f) Write the principle of phase shift oscillator.

g) Draw the output waveforms for class A, class B, class AB and class C of power amplifier.

h) State what will happen to the voltage gain of an amplifier if the bypass capacitor is open circuited.

i) Define the parameter f_T and discuss its significance,

j) Define Phase margin and Gain margin.

SECTION-B

2. Explain the need for coupling and bypass capacitors in transistor circuits and draw AC equivalent circuit of CE amplifier.

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3. Show that maximum collector efficiency of class A transformer coupled power amplifier is 50%.

4. What are the advantages and disadvantages of negative feedback in amplifier? Discuss the current shunt negative feedback amplifier.

5. Draw the circuit diagram of Hartley oscillator using BJT and briefly explain how oscillations are maintained in this oscillator.

6. State and explain Miller's Theorem.

SECTION-C

7. a) Define feedback. What type of feedback is used for oscillator circuit? D feedback effect on input and output impedance.

b) A voltage series feedback amplifier has the following data :

A = −500, R_i = 1.5k□□50k□□ and □ = – (1/10). Calculate amplifier gain, input and output impedances, draw topology for the same.

8. a) Draw the circuit diagram of a single stage RC coupled amplifier and explain purpose of each of the components used in the circuit,

b) In the RC coupled amplifier circuit of Fig.1, determine the cut-off frequencies and $f_{LC_{c2}}$ due to C_{c1} and C_{c2} respectively.

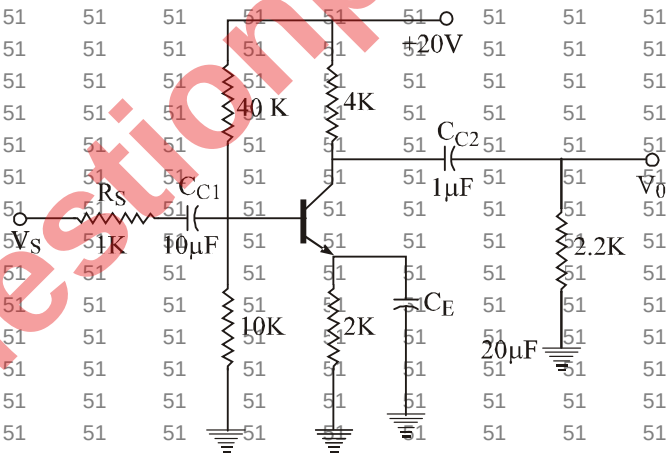

Fig.1

9. a) With neat block diagram, explain DC regulated power supply.

b) Write short notes on :

i. Transistor Shunt regulators.

ii. Crystal Oscillators

iii. Harmonic Distortion

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