

17/6/19

[Time: 3 Hours]

[Marks: 80]

Please check whether you have got the right question paper.

- N.B:
1. Question no one is compulsory.
  2. Attempt any three questions from the following.
  3. Assume suitable data wherever necessary.



- Q.1
- a) Compare Current series and Current shunt feedback configuration. (05)
  - b) Explain working of class C Power amplifier. (05)
  - c) Discuss LOG amplifier using Op-amp with neat circuit diagram. Derive expression for output and state disadvantages. (05)
  - d) State and Prove conditions of sustained oscillation. (05)

- Q.2
- a) What is an instrumentation amplifier? Draw a neat circuit of an instrumentation amplifier using 3 op-amps. Derive its output voltage equation. (10)
  - b) Draw a neat circuit diagram of a RC phase shift oscillator using op-amp. Derive its frequency of oscillation. What are the values of R and C for frequency of oscillation to be 1 kHz? (10)

- Q.3
- a) Evaluate  $A_{id}$ ,  $A_{cm}$ ,  $I_{CM}$ ,  $V_{CM}$  for DIBO differential amplifier. (10)  
Given  $\pm$  supply =  $\pm 20V$ ,  $R_c = 4.7k\Omega$ ,  $R_B = 1.5k\Omega$ ,  $R_E = 750\Omega$ ,  $\beta = 150$ .  
Discuss need of swamping resistor. (05)

- b) For power BJT the thermal resistance parameters are as follows.

$$\theta_{dev-case} = 3^\circ C/W \quad \theta_{case-sink} = 0.7^\circ C/W$$

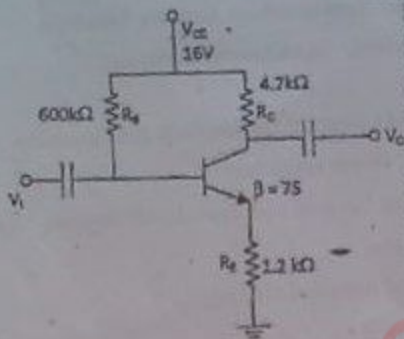
$$\theta_{case-amb} = 72^\circ C/W \quad T_{amb} = 40^\circ$$

$$\theta_{sink-amb} = 5^\circ C/W \quad T_{jmax} = 180^\circ$$

- c) Write a note on Sample and Hold Circuit using op-amp. (05)

- Q.4
- a) Design transformer coupled class A power amplifier to provide 9 W output to  $6\Omega$  load. (10)
  - b) Design a summing amplifier to add three input voltages. The output of this circuit must be equal to 3 times the negative sum of the inputs. (05)
  - c) Explain impact of negative feedback in amplifiers. (05)

- Q.5 a) Discuss shortcomings of ideal integrator and suggest solution for the same in detail. Draw frequency response for both the cases and develop output equation.  
 b) Find:  $G_{Mf}$ ,  $R_{in}$ ,  $R_{of}$



Q.6 Write short notes on (any four)

- a) Peak detector circuit using op-amp (05)  
 b) Use of Current Mirror circuit in differential amplifier (05)  
 c) Explain the following terms: (05)  
     i) CMRR  
     ii) Slew Rate (05)  
 d) Schmitt trigger (05)  
 e) Clipper & Clamper using op-amp