

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics & Communication Engineering) (Sem.-4)

ANALOG CIRCUITS

Subject Code : BTEC/401/18

M.Code : 77565

Date of Examiantion: 07-05-2024

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 have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

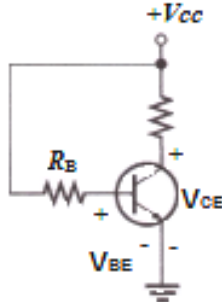
SECTION-A

1. Write briefly :

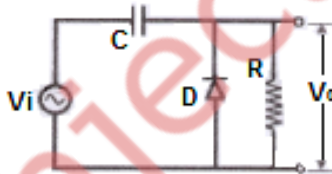
- a) What are the limitation of transistors at high-frequency?
- b) Compare the common collector configuration to common emitter of BJT amplifier.
- c) What is positive voltage clamping?
- d) Draw the output and transfer characteristics of B JT.
- e) Draw the circuit diagram for the Wien bridge oscillator.
- f) State and discuss the oscillation criteria in feedback amplifier.
- g) Compare Class-A to Class-B power amplifier.
- h) What is Avalanche breakdown in PN junction diode?
- i) Draw the high frequency model of MOSFET.
- j) Draw a push-pull amplifier and discuss working principle.

SECTION-B

2. For the following circuit, if $R_B = 1 \text{ K}\Omega$, $R_C = 10 \text{ K}\Omega$, $V_{BE} = 0.7 \text{ V}$, $V_{CC} = 5 \text{ V}$ common base current gain (α) of the transistor is 0.99. Find out the collector's current.



3. a) The open loop gain (A_{OL}) of a voltage amplifier is 100: The overall gain (A_{CL}) was reduced to 50 when negative feedback was applied. Calculate the fraction of the output voltage feedback,
b) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 75.
4. Determine and sketch output voltage, V_o for the network shown in the following figure:



Input voltage V_i is a square pulse varying from -20 V to $+20 \text{ V}$. Diode D is the ideal diode. Justify your answer.

5. A phase shift oscillator uses 5 pF capacitors. Find the value of R to produce a frequency of 800 kHz .
6. What is cross-over distortion? How can that be eliminated?

SECTION-C

7. Derive the maximum efficiency of a transformer coupled Class-A power amplifiers. Compare it with the direct coupled class-A power amplifier.
8. Draw the circuit of the hybrid pi model for a transistor in CE configuration. Using approximation, reduce it to calculate short circuit current gain.
9. a) Discuss types of feedback and compare them.
b) Explain the operation of the Wien bridge oscillator.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.