

Code No: 155SF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, August - 2022

ELECTRONIC CIRCUIT ANALYSIS

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Draw the two-stage cascaded amplifier diagram and write its advantages.
- b) Draw the circuit of cascode amplifier and discuss its requirements. [8+7]
- 2.a) Draw the hybrid- π equivalent circuit of a transistor at high frequencies in CE configuration. Define f_{β} and f_T and state their interrelationship. Derive an expression for f_T in terms of hybrid- π parameters.
- b) Given the following transistor measurements made at $I_C = 5$ mA and $V_{CE} = 5$ V and at room temperature. $h_{ie} = 600$ ohms, $h_{fe} = 100$, $C_{b'c} = 3$ PF and $A_i = 10$ at 10 MHZ. Find f_{β} , f_T , $C_{b'e}$, $r_{b'e}$ and $r_{bb'}$ of hybrid equivalent circuit in CE configuration? [9+6]
- 3.a) Explain the principle of negative feedback in amplifiers. Show quantitatively the effect of negative feedback on (i) Gain (ii) Stability (iii) Noise
- b) Show that current-series negative feedback increases the input impedance and increases the output impedance. [8+7]
- 4.a) Analyze emitter follower using feedback concept and derive necessary expressions.
- b) An amplifier with open-loop gain of 1000 delivers 10 W of output power. If 0.01 feedback is applied determine input power before and after feedback for the same output. [8+7]
- 5.a) Starting from the description of a generalized Oscillator, derive the expression for frequency of Oscillation in a Colpitts Oscillator.
- b) Draw the circuit diagram of RC-Phase shift oscillator using FET and derive the expressions for frequency of oscillations and condition on gain. [8+7]
- 6.a) Design a RC phase shift oscillator for a frequency of 5 KHZ. Derive equation used.
- b) Draw the LC oscillator circuit diagram and analyze it. [8+7]
- 7.a) Derive the expression for maximum conversion efficiency for a simple series fed Class A power amplifier.
- b) List out the advantages of complementary symmetry configuration over push pull configuration. [10+5]
- 8.a) Derive an expression for gate width of a monostable multivibrator.
- b) With the help of a neat circuit diagram, explain the operation of an astable multivibrator. [7+8]