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Code No: 154AW

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, August/September - 2021

ELECTRONIC CIRCUIT ANALYSIS
(Common to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

1.a) Calculate the g_m , r_{be} , $C_e = C_{be}$ and ω_f at $I_C = 1\text{mA}$ & $V_{CB} = 10\text{V}$ for a certain transistor having $C_b = C_{bc} = 3\text{pF}$, $h_{fe} = 200$, & $\omega_T = 500\text{M rad/sec}$ at room temperature.

b) Draw the circuit diagram for cascade amplifier and derive expressions for voltage gain and input impedance. [7+8]

2.a) Obtain the expressions for common emitter short circuit current gain and unity gain frequency of BJT Amplifier.

b) Derive the expression the bandwidth of the multistage amplifier. [7+8]

3.a) Derive expressions for voltage gain, input impedance and output impedance in case of voltage shunt feedback.

b) Explain the effect of negative feedback on:
(i) Gain (ii) Stability (iii) Noise (iv) Distortion. [7+8]

4.a) Draw the block diagram of current shunt feedback amplifier and derive the expression for R_{if} and R_{of} .

b) An amplifier has an input resistance of $200\text{ k}\Omega$, with a certain negative feedback introduced in the above amplifier the input resistance is found to be $20\text{ M}\Omega$ and overall gain is found to be 1000. Calculate the loop gain and feedback factor. [9+6]

5.a) Explain the factors effecting the stability of oscillators.

b) Draw and derive the expression for frequency of oscillation for Wien bridge oscillator. [5+10]

6.a) Derive the frequency of oscillation of Colpitts oscillator.

b) What is the equivalent circuit of a crystal? Derive the expressions for series and parallel resonances. [9+6]

7.a) Explain the operation of class-AB power amplifier. Why we use class-AB over class-B.

b) Draw and explain the operation of single tuned amplifier. [8+7]

8.a) With the help of circuit diagram, and necessary derivations show that a collector coupled astable multivibrator can function as a voltage to frequency converter.

b) Explain the operation of a Monostable multivibrator. [8+7]

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