

II B. Tech II Semester Regular Examinations, August/September - 2021
ELECTRONIC CIRCUIT ANALYSIS
 (Electronics Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unit
 All Questions carry **Equal** Marks

1 a) Draw the hybrid- π model of common emitter configuration and describe each component in the π -model. [8M]

b) Derive the equation for voltage gain bandwidth product for CE amplifier. [7M]

Or

2 a) Derive the expression for voltage gain of a common source FET amplifier with and without source resistance included in the circuit. [8M]

b) In the CS amplifier $R_L=5K\Omega$, $R_G=10 M\Omega$, $\mu=50$ and $r_d = 35 K\Omega$. Evaluate voltage gain, input impedance and output impedance. [7M]

3 a) With the help of a neat circuit diagram, describe the working of a cascode amplifier. [8M]

b) Explain three types of coupling methods used in multistage amplifiers. [7M]

Or

4 a) Draw the circuit diagram, equivalent circuit of a Darlington pair and derive expressions for overall voltage gain and input impedance. [8M]

b) An amplifier consists of 3 identical stages in cascade, the bandwidth of overall amplifier extends from 20Hz to 20kHz. Calculate the bandwidth of individual stage? [7M]

5 a) Explain the concept of feedback with block diagram. What are the advantages and disadvantages of negative feedback? [8M]

b) Show that current-series negative feedback increases the input impedance and increases the output impedance. [7M]

Or

6 a) Draw the circuit diagram of a current series feedback amplifier, Derive expressions of input & output impedances, Gain, feedback factor? [8M]

b) If negative feedback with a feedback factor, β of 0.1 is introduced into an amplifier with a gain of 20 and bandwidth of 0.6 MHz, obtain the resulting bandwidth of the feedback amplifier. [7M]

7 a) Derive the expression for frequency of oscillation and condition for sustained oscillations of a Colpitts oscillator. [8M]

b) Define the basic conditions for oscillations and classify oscillators? [7M]

Or

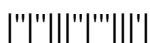
8 a) Explain why RC Phase shift oscillators are not used at high frequencies? With the help of diagram explain the operation of RC phase shift oscillator? [8M]

b) Why LC oscillators are not used at low frequencies. Derive the expression for frequency of oscillation for LC oscillator? [7M]

9 a) Give the expression for d.c power input, a.c power output and efficiency of a series fed, directly coupled class A amplifier? [8M]

b) What is thermal resistance? Explain the thermal-electrical analogy related to a transistor with heat sink? [7M]

Or



- 10 a) Draw and explain the circuit of double tuned amplifier with the help of frequency response? [8M]
- b) A single tuned RF amplifier uses a transistor with an output resistance of $60k\Omega$, output capacitance of $20pF$ and input resistance of next stage is $20k\Omega$. The tuned circuit consists of $47pF$ capacitance in parallel with series combination of $1\mu H$ inductance and 4Ω resistance. Calculate i) Resonant frequency ii) Effective quality factor iii) Bandwidth of the circuit [7M]

