

**R18**

Code No: 154AW

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, February - 2024

**ELECTRONIC CIRCUIT ANALYSIS**

(Common to ECE, EIE, ECM)

Time: 3 Hours

Max. Marks: 75

**Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

- 1.a) What is the frequency response of an amplifier, and why is it important? [2]
- b) Discuss the applications where Darlington pairs are commonly used. [3]
- c) Write the characteristics of current series feedback. [2]
- d) Explain the importance of feedback in amplifier design and performance. [3]
- e) Give the expression for frequency of oscillation RC phase shift oscillator. [2]
- f) Define frequency stability in oscillators. How is it measured or quantified? [3]
- g) How is biasing achieved in a series-fed Class A power amplifier? [2]
- h) How do Class AB amplifiers combine features of Class A and Class B amplifiers? [3]
- i) Write the concept of a bootstrap time base generator. [2]
- j) Discuss how a Schmitt trigger can be used for signal conditioning. [3]

**PART – B**

**(50 Marks)**

2. Draw the hybrid  $\pi$  equivalent of a CE transistor valid for high frequency and explain significance of each parameter. [10]

**OR**

3. Derive the expressions for higher and lower cut-off frequency of a multistage amplifier. [10]

4. Derive the expression for voltage gain, input resistance, output resistance of the current shunt negative feedback amplifier. [10]

**OR**

- 5.a) An amplifier requires an input signal of 60mV to produce a certain output with negative feedback to get the same output the required signal is 0.5V. The voltage gain with feedback is 90. Find the open loop gain and feedback factor.

- b) List and explain the general characteristics of negative feedback amplifier. [5+5]

6. Derive the oscillation condition for LC circuits. [10]

**OR**

7. Derive the expression for frequency of oscillation of BJT RC phase-shift oscillator with necessary explanation. [10]

QA QA QA QA QA QA QA G

8. Draw the class A Power Amplifier. Derive the efficiency of a class A power amplifier with necessary diagram. [10]

QA

QA QA OR QA QA QA QA

9. Demonstrate of an "n"-stage synchronously tuned amplifier, the highest achievable bandwidth occurs when each individual stage is set to a single-stage gain of 4.34 dB.

[10]

10. Discuss the operation of an astable multivibrator. Also, derive it's the associated equations. [10]

QA

QA QA OR QA QA QA QA

11. Describe the working principle of a transistor Miller time base generator in detail. [10]

---ooOoo---

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G