

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY- GURAJADA VIZIANAGARAM
II B. Tech I Semester Regular Examinations, November – 2024
ELECTRICAL CIRCUIT ANALYSIS-II
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 hours**Max. Marks: 70**

Question paper consists of Part A, Part B.
Part A is compulsory, Answer all questions.
In Part B, Answer any one question from each unit.

PART-A**(20 Marks)**

- 1
 - a) Distinguish between a Three phase balanced and Unbalanced systems [2]
 - b) Explain the significance of phase sequence [2]
 - c) List the advantages of Laplace – transform method [2]
 - d) Explain the concept of complex frequency [2]
 - e) Give the z- parameters in terms of the hybrid parameters [2]
 - f) Explain the significance of lattice network? [2]
 - g) List the various factors involved in the convergence of Fourier series [2]
 - h) What is mean square error w.r.t Fourier series and what does it signify [2]
 - i) Distinguish between Active and passive filters [2]
 - j) List the application of Active filters [2]

PART-B**(50 Marks)****Unit-1**

- 2
 - a) Derive the relationship between line voltage and phase voltage for a Delta connected Three phase system. [5]
 - b) Explain how total power can be measured by using Two wattmeter method for a three-phase balanced and unbalanced loads [5]

(OR)

- 3
 - a) Derive the relationship between line current and phase current for a Star connected Three phase system. [5]
 - b) A star-connected load has an impedance of $(3 + j6) \Omega$ in each phase and is connected across a balanced 415-V, 3-phase supply. Obtain the line currents, Power factor, total real power and reactive power consumed by the load. [5]

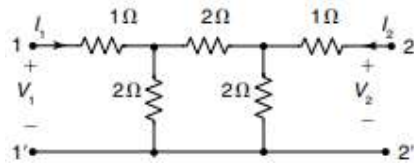
Unit-2

- 4 Derive the laplace transform of the following functions: [10]
 - i) Step Function
 - ii) Impulse function
 - iii) Cosine function
 - iv) t^n function

(OR)
- 5
 - a) State and explain final value theorem [5]
 - b) Realize the RC series circuit with Sinusoidal input using Laplace transform [5]

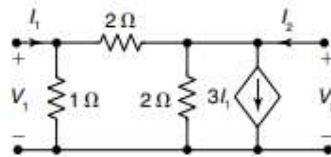
Unit-3

- 6 a) Derive the condition for reciprocity in terms of z-parameters [5]
 b) For the following network, determine the ABCD parameters [5]



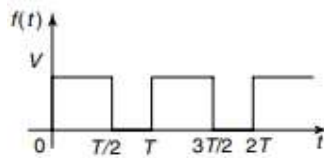
(OR)

- 7 a) Explain the series and parallel connections of two port networks and justify the conditions to be followed [5]
 b) Find the y – parameters for the following network: [5]



Unit-4

- 8 a) Explain the step-by-step procedure of evaluating the exponential form of Fourier series [5]
 b) Find the Fourier series for the following train of pulses: [5]



(OR)

- 9 a) Derive the Fourier transform of i) Unit Impulse function and ii) Unit step function [5]
 b) A series RLC circuit with $R = 5\Omega$, $L = 5\text{mH}$, $C = 50\mu\text{F}$ has an applied voltage $V(t) = 150 \sin 1000t + 100 \sin 2000t + 75 \sin 3000t$ volts. Determine the effective current and average Power [5]

Unit-5

- 10 a) Distinguish between a low pass filter, High pass filter and band Pass filter. [5]
 b) Explain in detail about the Constant K- type or prototype filters [5]

(OR)

- 11 a) Explain the operation of band Elimination filter with a neat circuit [5]
 b) Explain in detail about the Constant k -Type High pass filter and also draw its performance characteristics. [5]
