Total nos. of printed pages: 2 Roll No:

PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR

Even Semester Session 2021-22 CT -I

B. Tech. Second Semester

Basic Electrical Engineering (KEE-201T)

CO Number	Course Outcome (Please include all COs of your Course here)
CO1	To define [L1: Knowledge] basic laws, terminologies and theories pertaining to DC and AC (1-phase and 3-phase) electrical circuits.
CO2	Explain [L2: Comprehension] concepts of electrical circuits, the components of low voltage electrical installations, transformers and electromechanical energy conversion devices and their applications.
CO3	Apply [L3: Application] the concepts of transformers, AC & DC machines and energy consumption in solving real life numerical problems.
CO4	Analyze [L4: Analysis] and examine different types of DC and AC electrical circuits (1-phase and 3-phase).

Time: 1.5 Hrs. M. M. 15

Section A

Q1. Attempt all questions: **(1X3 = 3 Marks)**

a) Draw the volt ampere characteristics of an ideal and practical current source. CO1

b) Define unilateral and bilateral circuits. CO1

c) Define instantaneous value, time period, frequency, alternation, amplitude for the sinusoidal alternating quantity. CO1

Section B

Q2. Attempt all questions: **(2X4 = 8 Marks)**

a i) A 50 Hz sinusoidal voltage has a maximum value of 56·56 V. Calculate the value of voltage 0·0025 second after passing through maximum positive value. At what time measured from a positive maximum value will instantaneous voltage be 14·14 V?

Or

CO2

ii) Two coils connected in series have a resistance of 18 Ω and when connected in parallel have a resistance of 4 Ω. Find the value of resistances. CO2

b i) Using mesh analysis, calculate current Ix in the circuit shown in Fig. 1. CO4

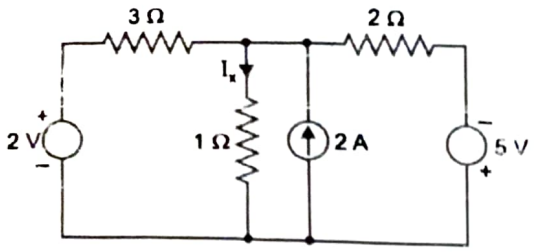

Fig. 1

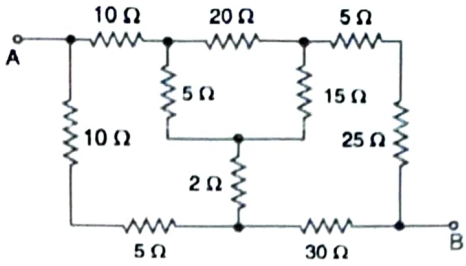

Fig. 2

Or

ii) In the network shown in Fig. 2, calculate the resistance between terminals A and B using star/delta transformation. CO4

c i) Using superposition principle, calculate the power across 23 Ω resistor in the circuit shown in Fig. 3. CO3

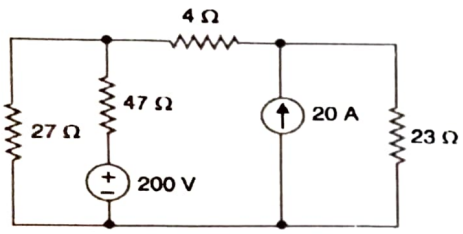

Fig. 3

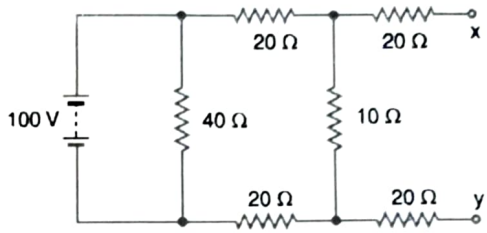

Fig. 4

Or

ii) Using Thevenin's theorem, calculate the power which would be dissipated in a 50 Ω resistor connected across xy in the network shown in Fig. 4. CO3

d i) Using delta/star transformation, calculate the resistance between terminals A and B of the network shown in Fig. 5. CO4

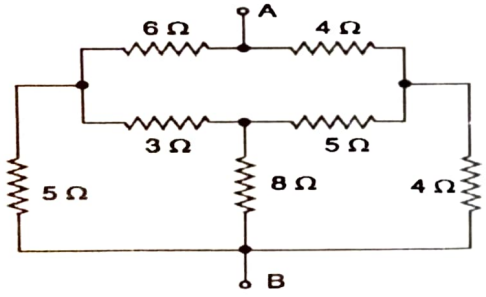

Fig. 5

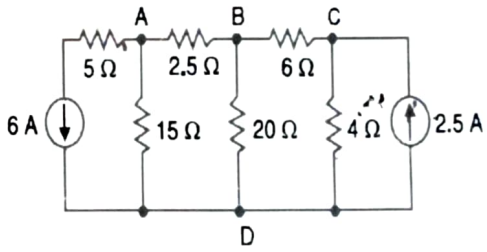

Fig. 6

Or

ii) Using nodal analysis, calculate the current in various resistors in the circuit shown in Fig. 6. CO4

Section C

Q3. Attempt all the questions. **(4X1 = 4 Marks)**

i) Using Norton's theorem, calculate the voltage between A & B in the network shown in Fig. 7. CO4

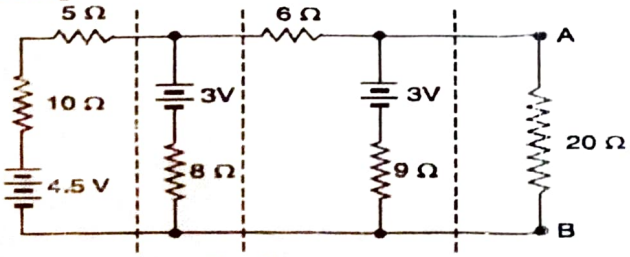

Fig. 7

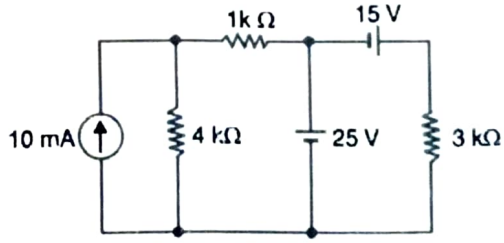

Fig. 8

Or

ii) Using superposition principle, calculate the voltage across 4 kΩ resistor in Fig. 8. CO4