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Total nos. of printed pages: 2

PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR CT -I

Odd Semester Session 2021-22

B. Tech. First Semester

Basic Electrical Engineering (KEE-101T)

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

(1X3 = 3 Marks)

Q1. Attempt all questions:

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

b) Define linear and nonlinear circuits. CO1

c) List the various types of sources used in electrical circuits. CO1

Section B

(2X4 = 8 Marks)

Q2. Attempt all questions:

a i) Find the current in 6 kΩ resistor in Fig. 1. by converting the current source to a voltage source. CO2

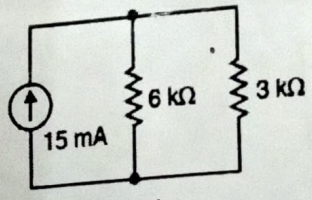

Fig. 1

Or

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 the voltage drop across the 1 kΩ resistor in the circuit shown in Fig. 2. CO4

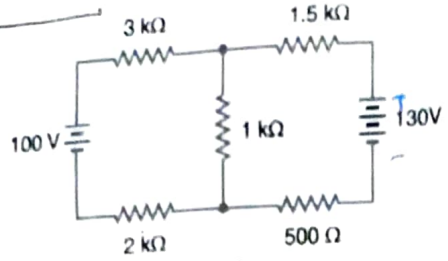

Fig. 2

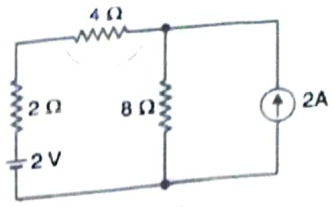

Fig. 3

Or

ii) Use nodal analysis to calculate the voltage across and current through 4 Ω resistor in the circuit shown in Fig. 3. CO4

c i) Using superposition principle, calculate the current through 10 Ω resistor in the circuit shown in Fig. 4. CO4

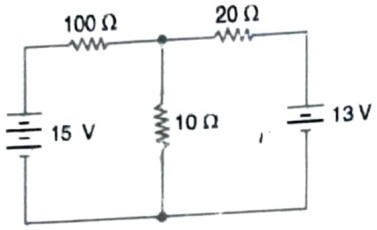

Fig. 4

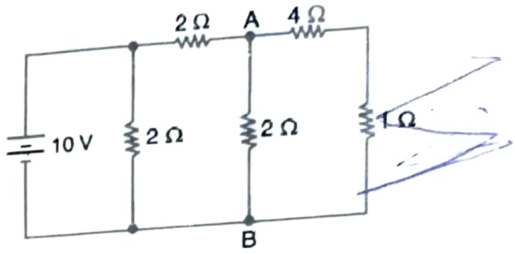

Fig. 5

Or

ii) Using Thevenin's theorem, calculate the potential difference across branch AB of the network shown in Fig. 5. CO4

d i) Using delta/star transformation, calculate the resistance between terminals A and C of the network shown in Fig. 6. CO3

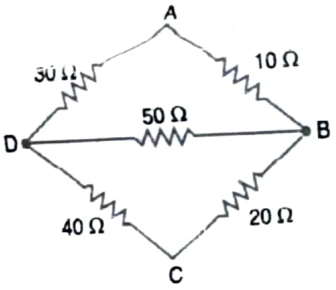

Fig. 6

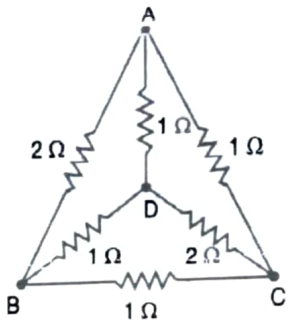

Fig. 7

Or

ii) In the network shown in Fig. 7, calculate the resistance between terminals B and C using star/delta transformation. CO3

Section C

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

i) Using Thevenin's theorem, calculate the current through the resistor R = 1Ω of the network shown in Fig. 8. CO4

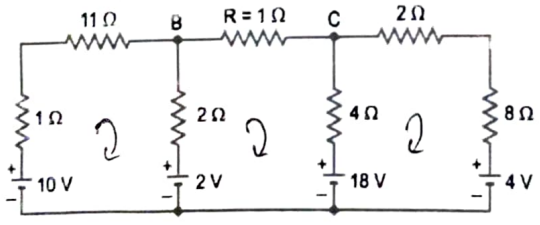

Fig. 8

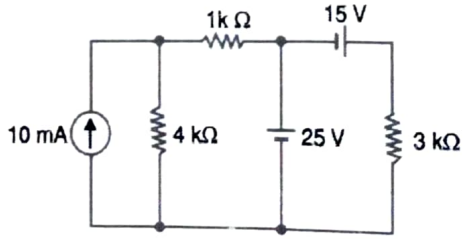

Fig. 9

Or

ii) Using superposition principle, calculate the voltage across 4 kΩ resistor in Fig. 9. CO4