

School of Basic Sciences

**Bachelor of Science Honours in Physics
Semester End Examination - Jun 2024**

**Duration : 180 Minutes
Max Marks : 100**

Sem II - C1UD202B - Electric Circuits and Networks

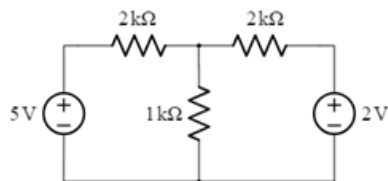
General Instructions

Answer to the specific question asked

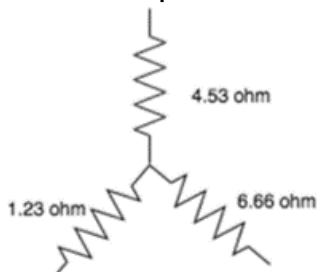
Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) What is the condition for maximum power transfer in DC and AC circuits? K1(3)
- 2) Compare shunt and series field coil construction. K2(4)
- 3) Explain the Hysteresis loss in transformer K2(6)
- 4) Express the mesh current equation in the circuit shown in figure and determine the currents. K3(6)

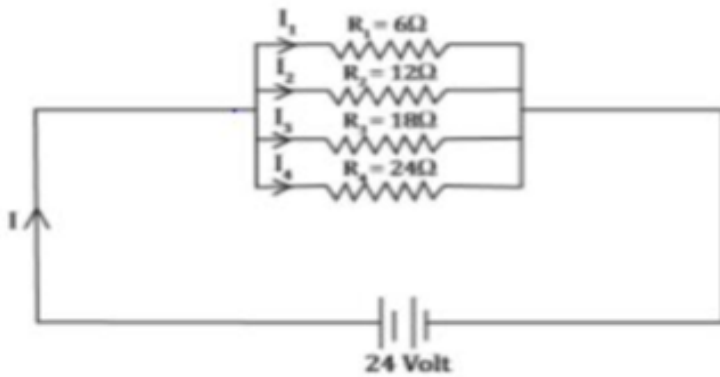


- 5) Find the equivalent delta circuit. K3(6)

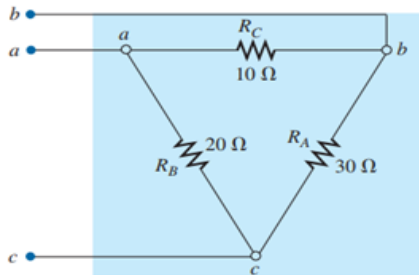


- 6) The four resistors 10 Ohms, 15 Ohms, 20 Ohms and 25 Ohms are connected in parallel with 24 Voltage supply. Calculate K3(9)
 - (i) Current through the branch of network
 - (ii) Supply Current

(iii) Total resistance of the circuit.



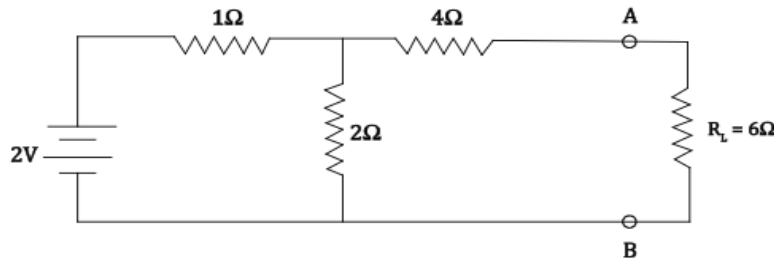
- 7) Draw and explain the construction and principle of operation of an AC generator K3(9)
- 8) Define an inductor ? Formulate the voltage, current, power and energy formulae for inductor. K4(8)
- 9) Discuss the following parameters in transformer: (a) transformer ratio (b) coefficient of coupling (c) mutual inductance K4(12)
- 10) Convert the given delta network into star network K5(10)



- 11) Why do we need tuned circuit? Using the circuit diagram explain the working of a single tuned amplifier. K5(15)

OR

Prove the Reciprocity Theorem for the problem as shown in Fig. K5(15)



- 12) A three phase balanced delta-connected load of $4+j8\Omega$ is connected across a 400V, 3ϕ balanced supply. Determine the phase currents and line currents (Phase sequence in RYB) K6(12)

OR

Draw the transient response of I , V_R , V_L in Series RL Circuit K6(12)