

ADMISSION NUMBER											

**School of University Polytechnic**

Diploma in Mechanical Engineering  
Mid Term Examination - Nov 2023

Duration : 90 Minutes  
Max Marks : 50

**Sem III - N1DI320B - Basics of Electrical and Electronic Engineering**

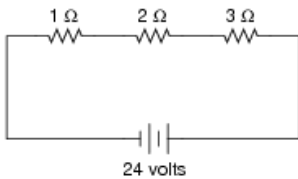
General Instructions

*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) Show the specific resistance of the conducting material. If the resistance of a conductor is 1 mm<sup>2</sup> in cross-section and 20 m long is 0.346 ? K2 (2)
- 2) Define electric power (P) and electric energy & derive relation between them. K1 (3)
- 3) Illustrate the amount of voltage “dropped” by each resistor and the amount of power dissipated by each resistor. When in the circuit, three resistors receive the same amount of current (4 amps) from a single source. K2 (4)

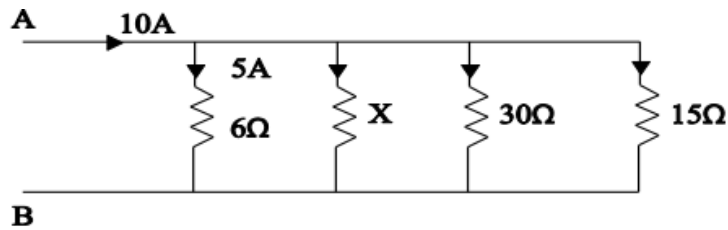


- 4) Explain the application & disadvantages when resistors are connected in series K2 (6)
- 5) Identify different terms used in AC Circuit. K3 (6)
- 6) Build & derive RL series AC circuit. K3 (9)

7) Focus on the Circuit shown in the figure, and calculate

K4 (8)

1. The current in all resistors.
2. The value of unknown resistance 'x'
3. The equivalent resistance between A and B



8) Analyze the given equation of an alternating current and then determine

K4 (12)

$$i = 40\sin 314 t$$

Determine

1. Max value of current
2. Average value of current
3. RMS value of current
4. Frequency and angular frequency
5. Form Factor
6. Peak Factor

What is the equation of a 50Hz voltage sin wave having a rms value of 50 volts

**OR**

Assume an RLC circuit with a resistor ( $R = 100 \Omega$ ), inductor ( $L = 0.1$  H), and capacitor ( $C = 0.01 \mu\text{F}$ ) connected in series to a sinusoidal voltage source ( $V = 120$  V,  $f = 50$  Hz), calculate the impedance, resonant frequency, and phase angle.

K4 (12)