Code No: 123BR

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, April/May - 2023
BASIC ELECTRICAL ENGINEERING
(Common to CSE, IT)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART- A

(25 Marks)

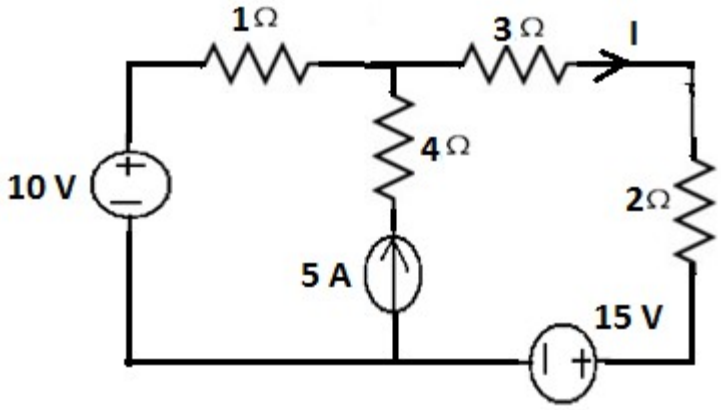
1.a)	Define Kirchoff's current law.	[2]
b)	What are the types of sources? Give examples.	[3]
c)	Define form factor of a sinusoidal waveform.	[2]
d)	What is J operator? Explain its significance.	[3]
e)	Define leakage flux.	[2]
f)	Define eddy current loss. How to reduce this in a single phase transformer?	[3]
g)	What is slip of 3-phase induction motor?	[2]
h)	What is a DC series motor? Draw the circuit diagram of dc series motor.	[3]
i)	What is the need for damping torque in measuring instrument?	[2]
j)	List out various instruments used to measure voltage, current and power.	[3]

PART-B

(50 Marks)

2.a) Discuss in detail about the start to delta conversion of resistive circuits in the suitable example.

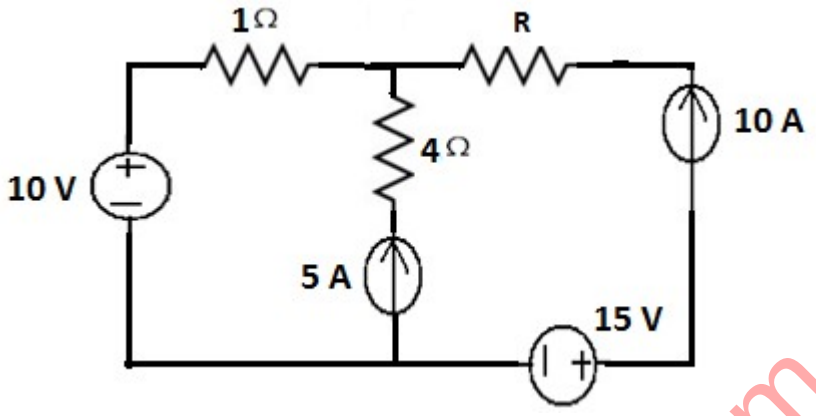
b) Using thevenin's theorem, find the current 'I' in the circuit below. [5+5]



OR

3.a) State and explain superposition theorem.

b) Find the maximum power delivered to the load resistor 'R' using maximum power transfer theorem. [5+5]



4.a) Derive the expression for average value and form factor of a sinusoidal waveform whose amplitude is A and whose time period is T.

b) Simplify the following expression [5+5]

$1\angle 0^{o} + 2\angle 90^{o} + 3\angle -90^{o}$

OR

5.a) Derive an expression for current flowing through a capacitor when it is subjected by A.C source of $\upsilon = V_m \sin \omega t$.

b) Find the impedance and current of R-L series circuit having R=10 Ω ; L=50 mH connected across 230V, 50Hz supply. [5+5]

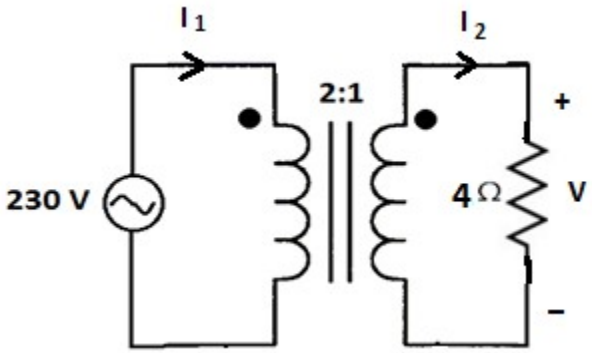
6.a) Explain the constructional details of single phase transformer

b) A 10 KVA single phase transformer has an efficiency of 98% at Full Load and also at Half Load. The power factor is unity in both cases. Find the efficiency of the transformer at 70% Load. [5+5]

OR

7.a) Derive the expression for the voltage regulation of single phase transformer for lagging load

b) For the ideal transformer shown below, find the currents I_1, I_2 and V. [5+5]



8.a) Explain the principle of operation of DC generator.

b) Discuss in detail about different losses in DC motors. [5+5]

OR

9.a) Discuss in detail about the working of three phase induction motor.

b) Obtain the torque equation of d.c motors. [5+5]

10.a) Give the detailed classification of instruments.

b) Explain the working of moving iron voltmeter. [5+5]

OR

11.a) Explain the basic working principle of Permanent Magnet Moving Coil (PMMC) instruments.

b) What are the advantages and limitations of Permanent Magnet Moving Coil (PMMC) instruments? [5+5]

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