Code No: 151AG **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year I Semester Examinations, March/April - 2023

BASIC ELECTRICAL ENGINEERING

(Common to EEE, CSE, IT, CSIT, ITE, CE(SE), CSE(CS), CSE(DS), CSE(N), CSD)

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)	State Norton's Theorem.	[2]
b)	Write short notes on voltage source and current source.	[3]
c)	Define power factor. What is the ideal value of power factor?	[2]
d)	What is balanced system and unbalanced system?	[3]
e)	Write the applications of an auto transformer.	[2]
f)	What is meant by ideal transformer? What are the properties of ideal transformer?	[3]
g)	Write the applications of single-phase induction motor?	[2]
h)	A 3 phase 4 pole, 50 Hz induction motor is running at 1455 rpm. Find the slip speed and slip.	[3]
i)	What is the component used in L.T switch gear.	[2]
j)	Define earthing, explain its importance?	[3]

PART - B

(50 Marks)

2.a) Using Thevenin's theorem, calculate Thevenin's Resistance, Thevenin's voltage across 5 ohms resistor (figure 1).

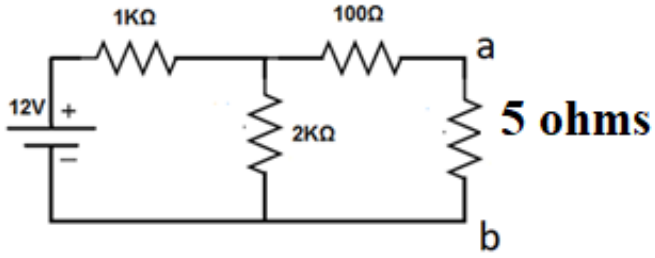

Figure 1

b) Find the current 'i' in the circuit below figure 2. [6+4]

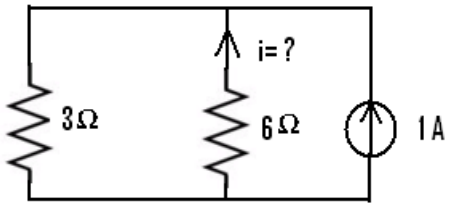

Figure 2

OR

3.a) State and explain Superposition Theorem.
b) Define time constant. Explain the time domain analysis of first order Series RL circuit. [5+5]

4.a) Find the impedance of series R-L-C circuit with R=50Ω, X_L=25Ω and X_C=10Ω.
b) Derive the average value, peak value, form factor for a sine waveform. [4+6]

OR

5.a) Derive an expression for average power in a single-phase circuit contains L element across sinusoidal voltage.
b) Give the relationship between phase voltage and line Voltage, phase current and line current for balanced three phase delta connected system. [5+5]

6.a) What are the various connections of three phase transformer?
b) Define voltage regulation, what is the meaning of zero regulation in transformer? [6+4]

OR

7.a) Explain types of losses that takes place in a transformer.
b) Draw and explain the equivalent circuit of a transformer. [5+5]

8.a) Explain the constructional details of three phase induction motor.
b) Draw torque slip characteristics of three phase induction motor. [5+5]

OR

9.a) Explain the constructional details of synchronous generator.
b) What are different methods to control speed of induction motor? [5+5]

10.a) Explain the types of batteries and its important characteristics.
b) Mention the importance of power factor improvement. [5+5]

OR

11.a) Write a short notes on battery back-up.
b) Explain how an MCB Works. [5+5]

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