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Code No: 113BR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, February - 2024

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)	State the Superposition theorem.	[2]
b)	State and explain Kirchhoff's laws.	[3]
c)	Define root mean square value of an alternating quantity.	[2]
d)	A series circuit has R=100 ohm and C=20 μF .At what frequency will the current lead the voltage by 30^0. Draw the corresponding phasor diagram.	[3]
e)	Define copper loss in a transformer.	[2]
f)	Distinguish between Ideal and a practical transformer.	[3]
g)	State the applications of d.c motors.	[2]
h)	List the constructional details of DC generators.	[3]
i)	Mention the essential features of measuring instruments.	[2]
j)	Write the classification of measuring instruments.	[3]

PART - B

(50 Marks)

2.a) Discuss the classification of sources in detail.
b) Three resistances of 25Ω, 50Ω and 100Ω are connected in parallel. If the total current drawn is 32 A, calculate the current drawn by each resistor. [5+5]

OR

3.a) State and explain Thevenin's theorem.
b) Write short notes on star-delta transformation. If R_{ab}, R_{bc} and R_{ca} are connected in delta, obtain the expressions for equivalent star connection. [5+5]

4.a) Explain the terms with respect to Alternating Quantity:
i) Average value
ii) Form factor
b) How do you generate alternating emf and explain the terms phase angle and Amplitude. [5+5]

OR

5. An a.c. circuit consists of a resistance of 5 ohms, an inductance of 0.1 H, and a capacitance of 100 μF, all in series. Determine for this circuit:
a) Total Impedance
b) Reactance
c) Admittance
d) Susceptance, and
e) Conductance.
The supply frequency is 60 Hz. [10]

6.a) Explain the working of transformer with a neat diagram.
b) Derive the emf equation of a single phase Transformer. [5+5]

OR

7.a) Explain the necessary tests that are conducted on transformer to find the efficiency and regulation.
b) The efficiency of 400 / 200 V, 200 KVA transformer is 98.5% at full load and at 0.8 lagging power factor. Calculate the values of core loss and full load copper loss. [5+5]

8.a) Explain the differences between self-excited and separately excited DC generators.
b) Explain the concept of rotating magnetic field in induction Motor. [5+5]

OR

9.a) Explain in detail about the production of torque in DC motors.
b) A dc machine induces an emf of 240 V at 1500 rpm. Find the developed torque for an armature current of 25 A. [5+5]

10. Explain the working of Attraction type moving iron instrument with a neat sketch. [10]

OR

11. What are the advantages and limitations of Permanent Magnet Moving Coil (PMMC) instruments? Explain its working principle. [10]

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