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C14-EE-303

4245

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2021

DEEE - THIRD SEMESTER EXAMINATION

ELECTRICAL CIRCUITS

Time : 3 hours]

[Total Marks : 80

PART—A

4×5=20

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **four** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State the limitations of Ohm's Law.
2. Define (i) Junction and (ii) Branch.
3. Define (i) Average Value and (ii) RMS Value.
- * 4. Define the terms 'Phase' and 'Phase difference'.
5. State the importance of 'j' operator.
6. Derive an expression for the impedance of 1-phase R-L series circuit.
7. Define Resistance and Inductance.
8. State the condition for Resonance in a Parallel circuit.
9. Define Polyphase and draw 3-phase waveforms.
10. List the advantages of 3-phase over 1-phase system.

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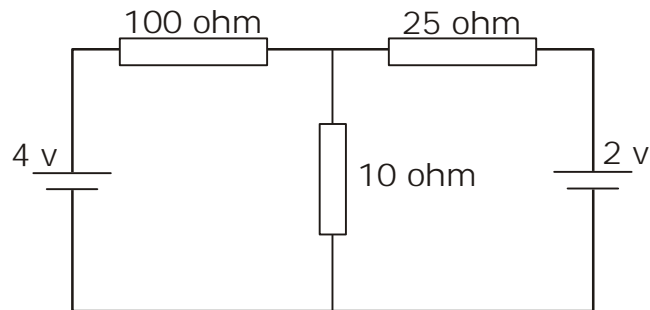
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PART—B

15×4=60

- Instructions :** (1) Answer *any four* questions.
(2) Each question carries **fifteen** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Develop Transformation formula from Delta to Star.
12. Determine the current in 10Ω resistor of the circuit shown below :



13. State and explain Superposition Theorem with a circuit diagram.
14. Derive RMS value of a Full-wave rectified alternating voltage.
15. Derive relationship between Voltage and Current in a pure inductive circuit and also obtain an expression for power.
16. A series R-L circuit whose resistance is 10Ω and inductance is 0.1 H is connected across a 230 V, 50 Hz supply. Calculate (a) Inductive reactance (b) Impedance and (c) Current.
17. Two impedances $Z = (6 + 8j)\Omega$ and $(10 + 5j)\Omega$ are connected in parallel across an AC source. If the total current is 15 A, find the current in each branch and supply voltage.
18. Derive the formula for measurement of 3-phase power by using Two-wattmeter method.

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