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C09-EE-303

3241

BOARD DIPLOMA EXAMINATION, (C-09)

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. Define active circuit and passive circuit.
2. State superposition theorem.
3. Define the following terms :
 - (a) Frequency
 - (b) Peak value
4. State the relation between poles, speed and frequency.
5. Convert the following from polar into rectangular form (a) $60 \angle 45^\circ$ and (b) $10 \angle 30^\circ$.
6. Define resistance and capacitance.
7. Define Q-factor.
8. Draw the waveforms for voltage and current in a pure inductive circuit.

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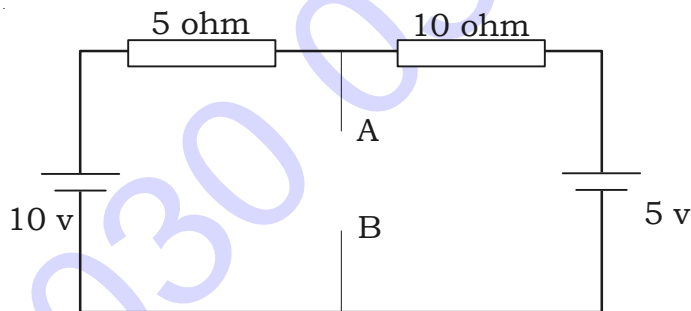
9. List the advantages of 3-phase system over 1-phase system.
10. Write down the relation between line and phase parameters (voltage and current) in a delta connected 3-phase system.

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 star to delta.
12. Obtain the Thevenin's equivalent circuit across AB terminals of the network given below :



13. (a) Explain ideal voltage source and ideal current source.
(b) Find the resonance frequency of R - L - C series circuit where $R = 100\Omega$, $L = 0.01$ H and $C = 50\mu\text{f}$.
14. An alternative current is represented by $i = 50 \sin 314t$. Determine (a) maximum value, (b) frequency, (c) time period and (d) average value.
15. A resistor of 120Ω and capacitance of $20\mu\text{f}$ is connected in series across a 200 V; 50 Hz supply. Calculate (a) impedance, (b) current (c) voltage across resistor, (d) voltage across capacitor and (e) power absorbed in the circuit.
16. Derive relationship between voltage and current in a pure capacitive circuit and also obtain an expression for power.

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- 17.** Explain the method of solving parallel circuit by admittance method.
- 18.** Three coils each having a resistance of 20Ω and inductive reactance of 15Ω are connected in star to 400 V, 3-phase and 50 Hz supply. Calculate (a) line current, (b) power factor and (c) power supplied.

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