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C14-EE-303

4245

**BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2018
DEEE—THIRD SEMESTER EXAMINATION
ELECTRICAL CIRCUITS**

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

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

1. Define passive circuit and draw a passive circuit.
2. State the limitations of Ohm's law.
3. Define:
 - (a) Maximum value
 - (b) Cycle
4. Explain the following terms :
 - (a) Phase
 - (b) Phase difference

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5. Perform $(50 \angle 30^\circ) \cdot (5+j5) / (10 \angle -20^\circ)$ and express answer in polar form.
6. Define capacitive reactance and write down the formula for it.
7. Derive an expression for current in an R-L series circuit.
8. List the methods available for solving parallel circuits.
9. The phase voltage of 3 , 5 MVA star connected alternator is 6500V. Calculate the line voltage and full load line current of the alternator.
10. State the advantages of polyphase circuit.

PART—B

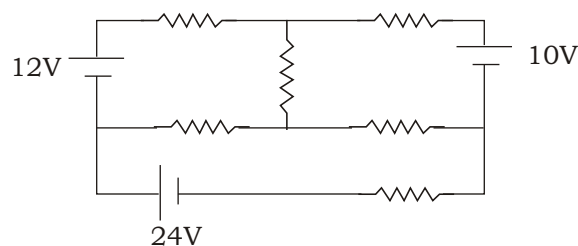
10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) The answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Derive the transformation formulae for delta to star and star to delta.
12. Determine the current in the 4 Ω resistor in the circuit shown below, using Kirchhoff's laws.



13. A Wheatstone bridge has the following resistances. Arm AB=2 Ω , BC=10 Ω , CD=6 Ω , DA=4 Ω . A galvanometer of resistance 5 Ω is connected across the terminals BD. A battery of 24V is connected across the terminals AC. Find the current through the galvanometer using Thevenin's theorem.

14. Derive expressions for the average value and RMS value of half-wave rectified sine wave.
15. A series RLC circuit has resistance of 5Ω , inductance of 0.5H and capacitance of $10 \mu\text{F}$ connected across 200 V , 50 Hz supply. Find the input current, voltage across each element and p.f. of the circuit.
16. Define resonance in series RLC circuit. Derive an expression for resonance frequency of a series circuit. Why a series resonant circuit is known as acceptor circuit?
17. Two impedances $Z_1=(5+j8) \Omega$ and $Z_2=(7-j13) \Omega$ are connected in parallel, across 110 VAC supply. Find (a) total impedance, (b) current in each branch, (c) total current. Also draw the phasor diagram
18. (a) Show that in 3-phase circuit the power measured by two wattmeters in a balanced load is equal to total power in circuit.
(b) The power in a 3-phase circuit is measured by two wattmeters. If the total power is 100 kW , and the power factor is 0.66 leading, what will be the reading of each wattmeter?
