



C09-EE-303

3241

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2013
DEEE—THIRD SEMESTER EXAMINATION
ELECTRICAL CIRCUITS**

Time : 3 hours]

[*Total Marks* : 80

PART—A

Instructions : (1) Answer **all** questions.

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

(3) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define the terms (a) active circuit and (b) passive circuit.
2. Explain ideal voltage source.
3. Give the relation among poles, speed and frequency.
4. Define the terms (a) frequency and (b) form factor.
5. Define and give the formula for average value of sinusoidal current.
6. Give the relation between voltage and current in pure inductor.
7. Give the formula for power factor and power in R - C circuit.
8. Give the expression for resonance frequency in R - L - C parallel circuit.

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9. Give the advantages of polyphase system over single-phase system.
10. Define polyphase and draw 3-phase waveforms.

PART—B

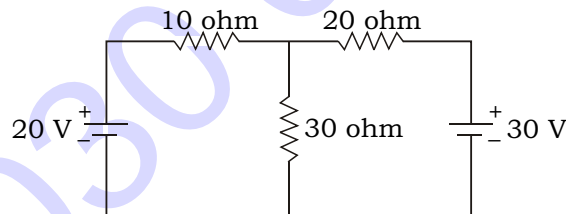
Instructions : (1) Answer *any five* questions.

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

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

11. Derive the formula for delta to star transformation. 10

12. Use Thevenin's theorem to find current through 30 ohm resistor : 10



13. (a) Explain maximum power transfer theorem. 5

(b) Find the resonance frequency of $R-L-C$ series circuit having resistance 10 Ω , inductance 20 mH and capacitance 100 μF . 5

14. (a) The equation of an alternating current is $v = 400 \sin 318t$. Determine (i) maximum value, (ii) frequency, (iii) r.m.s. value and (iv) average value. 5

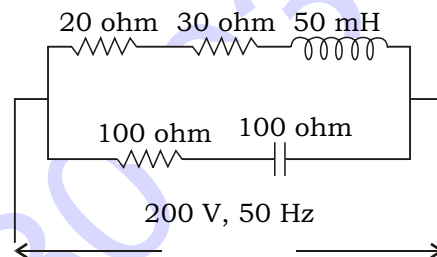
(b) Convert the following polar to rectangular or rectangular to polar : 5

(i) $100 \angle 30^\circ$

(ii) $8 - j6$

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15. A choke coil is connected to a variable frequency a.c. source, the voltage of which kept constant at 200 V. When the frequency of the supply is 50 Hz, an ammeter in the circuit connected in series reads 50 A. On increasing the frequency to 100 Hz, the current indicated by the ammeter falls to 25 A. Calculate the circuit parameter. 10
16. Two impedances Z_1 ($5 - j10$) and Z_2 ($10 + j15$) are connected in parallel. If the total current supplied to the combination is 20 A, find (a) the voltage applied, (b) PF and (c) power dissipated in each branch. 10
17. Find current in each branch and total current. Also find the current when 100 V d.c. applied across the circuit : 10



18. A 3-phase induction motor working on 400 V takes a line current of 30 A at p.f. of 0.866 lag. Two wattmeters are connected to measure the input power to the motor. What will be the wattmeter readings? 10

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