



C16-EE-303

6239

BOARD DIPLOMA EXAMINATION, (C-16)
OCT/NOV—2017
DEEE—THIRD SEMESTER EXAMINATION
ELECTRICAL CIRCUITS

Time : 3 hours]

[Total Marks : 80

PART—A

10×3=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. List any three applications of potentiometers. 1+1+1=3
2. State Kirchhoff's voltage law and Kirchhoff's current law. 1½+1½=3
3. Define loop, branch. 1½+1½=3
4. State Thevenin's theorem.
5. Solve $(8+6i)(4+3i)$ and express the result in rectangular form.
6. Define Q factor.
7. Find the resonance frequency of RLC series circuit having $R = 100 \Omega$, $L = 10 \text{ mH}$ and $C = 50 \mu\text{F}$.
8. Draw admittance triangle for an inductive circuit.

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9. List any three advantages of 3 phase system over 1 phase system. 1+1+1=3

10. A balanced star connected load of $(6+8j)$ per phase is connected to a balanced 3 phase 400 V supply. Find line current, power factor and power drawn. 1+1+1=3

PART—B 5×10=50

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

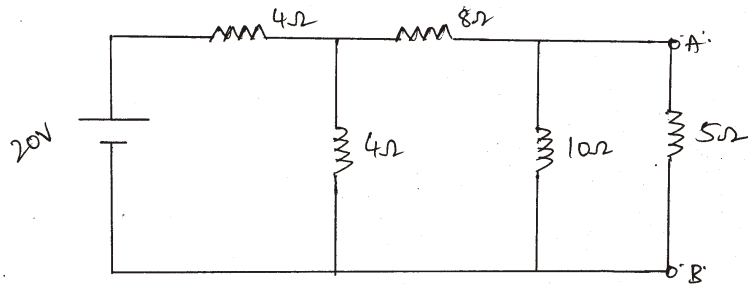
(2) Each question carries **ten** marks.

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

11. Explain the working of (a) series ohmmeter and (b) shunt ohmmeter. 5+5=10

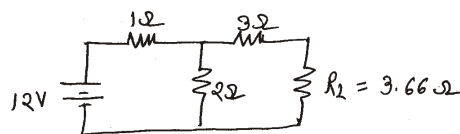
12. Develop transformation formulae from (a) delta to star and (b) star to delta.

13. (a) Determine the current through 5 Ω resistor in the given circuit. 5



(b) (i) State maximum power transfer theorem. 2

(ii) Determine the maximum power that can be delivered by the circuit shown. 3



14. A sinusoidal current is given by $i = 50 \sin(100 \pi t)$. Determine (a) average value, (b) maximum value, (c) RMS value and (d) time interval between maximum and next zero value.
15. Derive relationship between voltage and current in a pure inductive circuit. Also obtain an expression for power.
16. A coil is connected in series with a $20 \mu\text{F}$ capacitor across a single phase 230 V, 50 Hz supply. The current by the circuit is 8A and power consumed is 200 W. Calculate inductance of the coil if power factor is (a) leading and (b) lagging.
17. Explain the method of solving parallel circuit by admittance method.
18. A star connected alternator supplied a delta connected load of $(10+8j) \Omega$. If the voltage is 230 V. Find (a) current in each phase of load and alternator, (b) phase voltage of alternator, (c) power factor of the load and (d) power drawn by the load.
