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C16–EE–303

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BOARD DIPLOMA EXAMINATION, (C–16)

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. Write any three differences between series and shunt ohmmeters.

2. Define junction, branch.

3. Obtain delta equivalent for the star circuit with resistors $R_a = 3\Omega$, $R_b = 2\Omega$, $R_c = 1\Omega$ in star.

4. State Norton's theorem.

5. Define Instantaneous value, Average value and from factor of an Alternating quantity.

6. Show that power consumed in a pure inductive circuit is zero.

7. Define the terms inductance and capacitance.

8. List the three methods for solving ac parallel circuits.

9. Write the expressions for polyphase emfs and represent them by phasor diagrams.

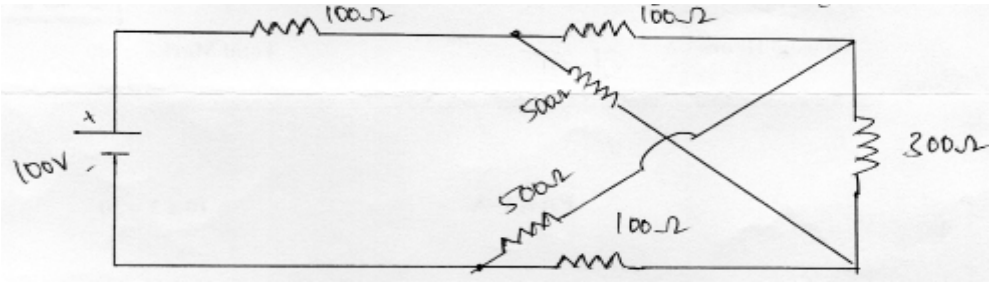
10. Express the formula for measurement of 3-phase power and Power factor by using two - voltmeter method.

PART–B 10×5=50

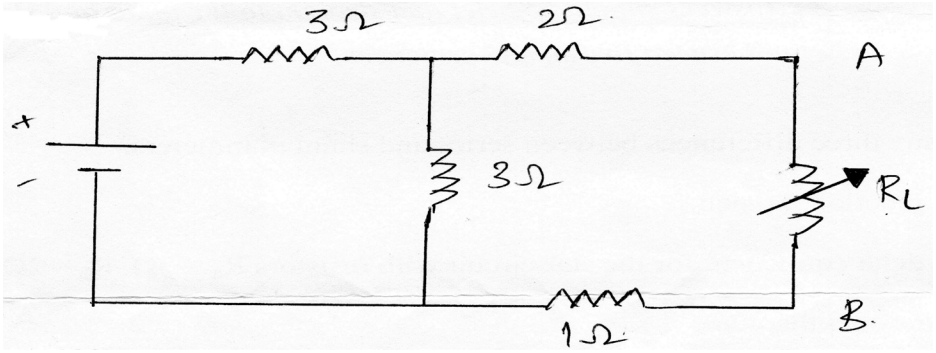
Instructions : (1) Answer *any* **five** questions.
(2) Each questions carries **ten** marks.
(3) Answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

11. Explain the measurement of unknown resistance by potentiometer.

12. Determine the current supplied by the battery as shown in the given circuit using KVL.



13. (a) Find the value of R_L in the circuit for Maximum Power Transfer and also calculate Maximum Power.



(b) A 3 phase 400V motor load has a power factor of 0.4 lag. Two wattmeter's are connected in circuit to measure the input. They show the input to be 30kW. Find the reading of each instrument.

14. Derive Average value, RMS value, Form factor and Peak factor for a triangular waveform.

15. A circuit of 20 μF is connected in series with a resistor of 120Ω across a 200V, 50Hz supply. Calculate (a) Impedance (b) Current (c) Voltage across resistor and capacitor (d) Power factor and phase angle (e) Power absorbed in the circuit.

16. A series circuit having a resistance of 10Ω, an inductance of 0.25H and capacitance is connected across a 100V, 50 Hz supply. If the circuit takes a current of 8A. Calculate (a) Impedance (b) Capacitance (c) Power factor and (d) Power consumed.

17. Two impedances Z = (6-8i)Ω and (16+12i)Ω are connected in parallel across an AC source. If the total current is (20+10i)A. Find the current is each branch and supply voltage.

18. Derive the relationship between line and phase value of current and voltage in a 3 phase Delta circuit.

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