C16–EE–303

# 6239

## 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 $R_a$ = 3Ω, $R_b$ = 2Ω, $R_c$ = 1Ω 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.

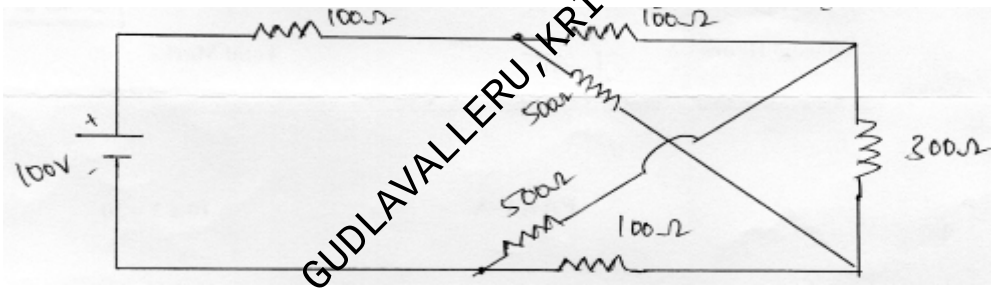
**10.** Express the formula for measurement of 3-phase power and Power factor by using two - voltmeter method.

## PART–B 10×5=50

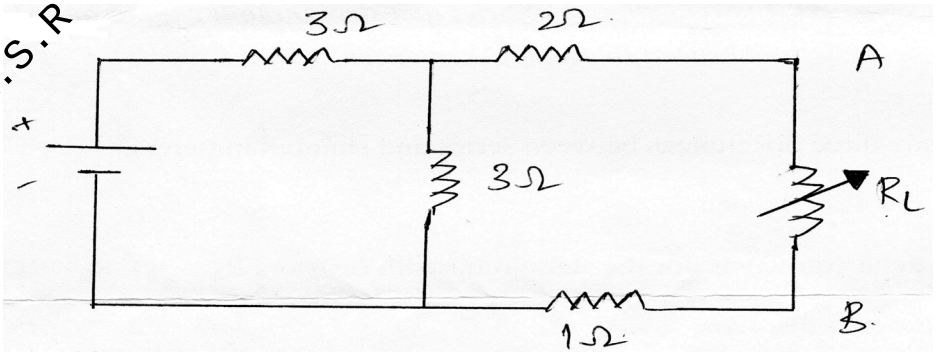
***Instructions :*** (1) Answer *any* **five** questions.
(2) Each questions carries **ten** marks.
(3) Answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

**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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