

Printed Pages: 6

NEE-201/NEE-101/EEE-201/EE-201

(Following Paper ID and Roll No. to be filled in your
Answer Books)

Paper ID : 199227

Roll No.

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B.TECH.**Theory Examination (Semester-II) 2015-16****BASIC ELECTRICAL ENGINEERING****Time : 3 Hours****Max. Marks : 100****Section-A**

1. Answer all parts in few sentences/words : (10×2=20)
 - (a) Distinguish between active and passive elements.
 - (b) A 40 V d.c. source has internal resistance of 2 ohm and supplies a resistive load. What can be maximum power drawn by the load ?
 - (c) The equation of an alternating current is $i = 141.4 \sin 314t$. What is r.m.s. value of current and frequency ?
 - (d) What do you mean by apparent power, active power and reactive power ?

(1)

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- (e) In two watt meter method of power measurement in three phase circuit the readings of both watt meters are equal. What is power factor ?
- (f) Why is scale of moving iron instruments nonlinear ?
- (g) Large ampere turns are needed to create flux in the air gap as compared to steel. why ?
- (h) A 400v/200v single phase transformer has primary winding resistance 1.0 ohm and secondary winding resistance 0.2 ohm. What will be total resistance of transformer referred to the primary side ?
- (i) Draw torque v/s speed characteristics of a d.c. series motor and explain why the motor should not be started at no load.
- (j) Draw slip v/s torque characteristics of a three phase induction motor and indicate
 - (i) Stable operating zone
 - (ii) induction generator operating zone.

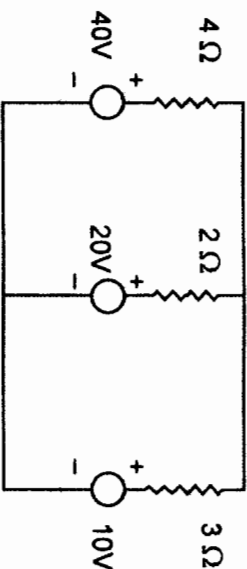
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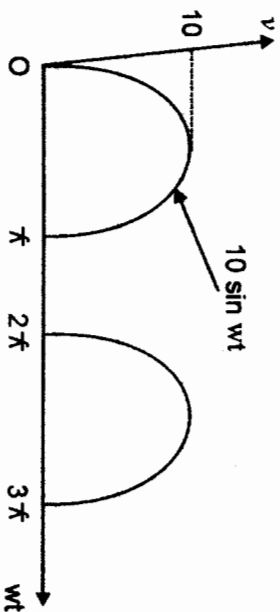
Section-B

2. Answer any five questions : (10 × 5 = 50)

- (a) Find current in 2 ohm resistance in the following figure using loop analysis method.



- (b) Find average and r.m.s. values of following voltage waveform



- (c) Explain resonance in a series RLC circuit with the help of impedance v/s frequency diagram and derive an expression for resonant frequency. Write properties of series resonance circuit.

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(d) Three similar coils each having a resistance of 10 ohm and an inductance of 0.0318 H in series are connected in delta. The line voltage is 400V, 50 HZ. Calculate :

- (i) phase current
- (ii) line current
- (iii) power factor
- (iv) total power in the circuit

Explain construction and principle of operation of a permanent magnet moving coil instrument with the help of a neat diagrams. Why is scale uniform ?

Define following with respect to a magnetic circuit :

- (i) magnetomotive force
- (ii) flux
- (iii) Reluctance
- (iv) Flux density
- (v) magnetic field intensity.

Give analogous of each term in corresponding electric circuit.

(g) A 50 KVA transformer has a core loss of 400 w and a full load copper loss of 800 w. The power factor of the load is 0.9 lagging calculate

- (i) full load efficiency
- (ii) the maximum efficiency and the load at which maximum efficiency occurs.

(h) A 6-pole lap wound dc shunt motor has 250 armature conductors, a flux of 0.04 wb/pole and runs at 1200 rpm. The armature and field winding resistances are 1 ohm and 220 ohm respectively. It is connected to a 220V dc supply. Determine

- (i) induced emf in the motor
- (ii) armature current
- (iii) input supply current
- (iv) mechanical power developed in the motor
- (v) torque developed.

Section - C

Note : Answer any questions of the following : (15×2=30)

3. (a) State and prove maximum power transfer theorem. (7)

(4)

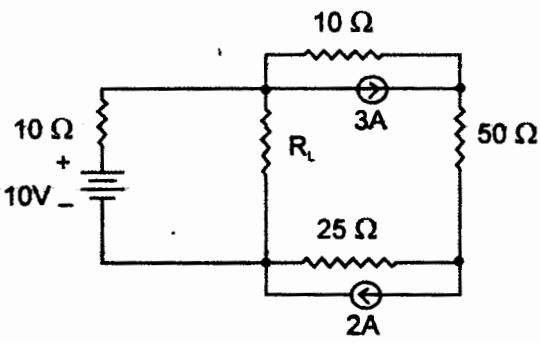
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- (b) In the circuit shown below, determine value of R_L for maximum power transfer condition and also obtain maximum power transferred to the load. (8)

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Using double revolving field theory explain why single phase induction motor is not self starting. Describe capacitor start - capacitory run method for starting single phase induction motor and give two applications of such motor. (15)

- (a) Why a three phase synchronous motor is not self starting ? Discuss use of damper winding for starting a synchronous motor. (10)
- (b) Explain single phase autotransformer and give its two applications. (5)

(6)

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