AUTUMN END SEMESTER EXAMINATION-2014

1st Semester B.Tech & B.Tech Dual Degree

ELECTRICAL SCIENCES EE-1001

(Regular-2014 Admitted Batch)

Full Marks: 60 **Time: 3 Hours**

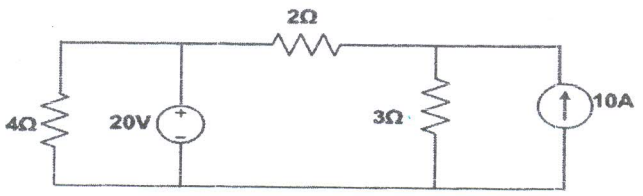
Answer any SIX questions including Question No.1 which is compulsory.

The figures in the margin indicate full marks.

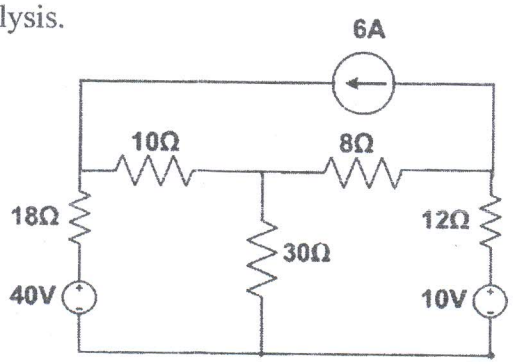
Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. a) Write the main parts of D.C. machines. [2 × 10
   b) State and explain Superposition theorem.
   c) Define the average value, RMS value, Form factor, Peak factor in A.C. circuit.
   d) Write four advantage of star connection over delta connection.
   e) What is eddy current loss and how it is being minimized?
   f) List out four uses of DC series motor.
   g) Draw the power triangle and explain about all types power and mention there units.
   h) Name the different types of torque present in indicating instrument.
   i) Differentiate between hydro power plant and thermal power plant.
   j) Differentiate between salient pole and cylindrical pole machines.

2. a) Find V_{TH}, I_N and R_{TH} if the load resistance is $3\,\Omega$. [2+2+1



b) Find the current across the $30\,\Omega$ resister by using Nodal analysis. [3



3. a) A $50\,\Omega$ resistor, $100\mu F$ capacitor and 0.05H inductor are connected in series to a 100V, 50Hz sinusoidal supply. Calculate (i)impedance (ii)power factor (iii) current and(iv) reactive power. Draw the phasor diagram. [4

b) Derive the expression for power consumed in a single phase series RL circuit, also draw the impedance triangle. [4

4. a) An alternating current of frequency 50Hz has a maximum value of 200A. Calculate (i) its value 1/500 second after the instant the current is zero and its value decreasing there afterwards. (ii) How many seconds after the current is zero and then increasing will attain the value of 86.6A? [4

b) Derive the expression for power measured by two wattmeter method for 3 ϕ load. [4

5. a) A balanced three phase load consists of three coils, each of resistance 3 Ω and inductive reactance 4 Ω conned to a 200V AC supply. Find the power consumed when the coils are (i) star connected and (ii) Delta connected. [4

b) With neat sketch show the general lay out of a power system and explain each component of the system. [4

6. a) Explain with neat diagram the construction, working, advantages and disadvantages of PMMC Instrument. [4

b) Write the similarities and dissimilarities between magnetic circuit and magnetic circuit. [4

7. a) Write the types of DC generators and write the voltage equation of all types of DC generator. [4

b) Write the working and construction of three phase induction motor. [4

8. Write short notes on (any two): [4+4

a) Earthing

b) Energy meter

c) LED lamp

d) Hysteresis loop

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