

Exam. Code: 0905  
Sub. Code: 6659

1129  
B.E. (Electrical and Electronics Engineering)  
First Semester  
EE-E101: Basic Electrical Engineering

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

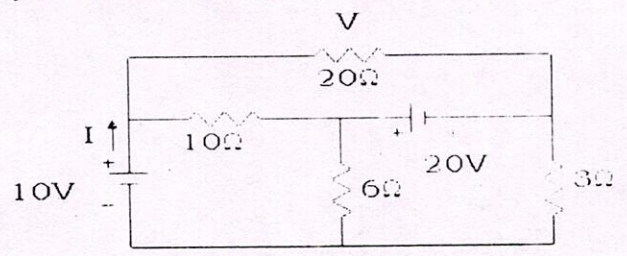
x-x-x

- I. Attempt the following:-
  - a) What is a balanced three phase load? Give example.
  - b) Why voltage short is short circuited when used for solution in electrical network?
  - c) What is meant by a phasor? How is it different from a vector?
  - d) Why are transmission of power done at high voltage level? Hence give the voltage levels used for transmission in Indian Power System.
  - e) Give a single line diagram of a power system? (5x2)

UNIT – I

- II. a) A coil of 5 Ω resistance has an inductance of 0.3H and is connected in parallel with a condenser of 100 μF capacitance with is in series with 10 Ω resistance. Calculate the resonant frequency and the power factor.
- b) How voltage sources are different from current sources? Show various types of dependent and independent sources. Can a voltage source be converted in to an equivalent current source? Explain with the help of an example. (2x5)

- III. a) Apply nodal analysis for the circuit given below and find the current 'I' and voltage 'V' and verify the same using mesh analysis



(10)

- IV. a) Two wattmeters are used to measure power in a three-phase balanced load. The wattmeter reading are 8.2 kW and 7.5 kW. Calculate:
  - i) Total Power
  - ii) Power factor
  - iii) Total Reactive Power

P.T.O.



(2)

- b) Prove that the power in 3 phase load remain constant irrespective of the connection of the 3-phase load. (2x5)

UNIT - II

- V. a) The flux linkage in coil 1 is 3 Wb and it has 500 turns and the current in coil 2 is x A, calculate the value of x if the mutual inductance is 750H.  
b) Explain the B/H curve as used in the magnetism and prove that the area under this is the energy loss. (2x5)
- VI. a) The O.C and S.C test data are given below for a single phase, 5 kVA, 200V/400V, 50Hz transformer.  
O.C test from LV side: 200V, 1.25A, 150W  
S.C test from HV side: 20V, 12.5A, 175W  
Find the efficiency and voltage regulation at 0.8 pf lagging.  
b) Give a circuit set up for conducting short circuit test on a single-phase transformer and hence explain why only variable losses are calculated through this test. (2x5)
- VII. a) Differentiate the principle of operations of DC motor and generator. Hence deduce the equation for EMF generated by the DC machine.  
b) An 8-pole alternator running at 750 rpm supplies power to a 6 pole three phase induction motor. The induction motor has full load slip of 3%. Calculate frequency of its rotor emf. (2x5)

x-x-x