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OIEE-001

00521

B.Tech. DECVI/DELVI/DCSVI/ACECVI/ ACELVI/ACCSVI

Term-End Examination

December, 2012

OIEE-001 : BASICS OF ELECTRICAL ENGINEERING

Time : 2 hours *Maximum Marks : 70*

*Note : Answer **five** questions in all and question number **one** is **compulsory**.*

1. (a) State whether the following statements are ***true*** or ***false*** : **5x1=5**

(i) The length of the conductor or wire is doubled and its area of cross section is also doubled, then the resistance will remain unchanged.

(ii) M.M.F. is analogous to electric current in electric circuit.

(iii) The coefficient of coupling of two coils is proportional to $1/\sqrt{L_1 L_2}$.

(iv) The power dissipated in the pure capacitance of an R-C Series circuit will be zero.

(v) A 3 phase load is said to be balanced load, if all the three phases have the same impedance and power factor.

(b) Fill in the blanks for the following : **5x1=5**

(i) The unit of specific resistance is _____.

(ii) Magnetic fuse in the magnetic circuit corresponds to _____ in electric circuit.

(iii) The unit of Coefficient of Coupling is _____.

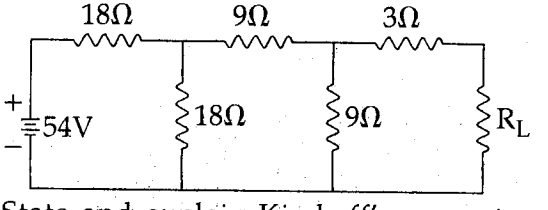
(iv) In a star connected system, the phase difference between line and phase voltage is _____.

(v) Peak factor is defined as ratio of _____ and _____.

2. (a) Explain the construction and working of a lead acid battery. 7

(b) Explain constant current and constant voltage method of charging battery. 8

3. (a) Determine the current flowing through R_L (Load Resistance) when the value of load resistance is (i) 3 Ω (ii) 6 Ω by using the Thevenin Theorem of the following network. 7



(b) State and explain Kirchaff's current and voltage laws. 8

4. (a) Explain the behaviour of a current carrying conductor when placed in the magnetic field. State flemings left hand rule. 7

(b) An Iron ring of mean length 1 m has an air gap of 1 mm and a winding of 200 turns. If the relative permeability of iron is 500 when a current of 1 A flows through the coil, find the flux density. 8

5. (a) State and explain Faradays law of electro-magnetic induction. 7

(b) Two coils have a mutual Inductance of 0.6 H. If the current in one coil is varied from 4 A to 1 A in 0.2 seconds. Calculate 8

(i) average emf induced in the other coil.

(ii) the change of flux linking the later assuming that it is wound with 150 turns.

6. (a) Give the comparison of series and parallel resonant circuits. 7

(b) (i) Define power factor. State its practical importance. 8

(ii) Explain Impedance triangle, True Power and Reactive Power.

7. (a) Derive the relationship between line voltage and line current with phase voltage and phase current respectively in a star connected circuits. 7

(b) Three coils each having resistance of 10 Ω and inductance of 0.02 H are connected in star across 440 V, 50 Hz, 3 phase supply. Calculate the line current and the total power consumed. 8

8. Write notes on ***any two*** of the following : 7½x2=15

(a) Advantages of 3 phase over single phase system.

(b) Ohm's law.

(c) Care and maintenance of lead acid battery.

(d) Difference between AC and DC.