NEW SCHEME

ELE15/25

USN | | | | | | | | | | |

First/Second Semester B.E. Degree Examination, February/March 2005

Common to all branches

Basic Electrical Engineering

Time: 3 hrs.] [Max.Marks : 100

Note: *Answer any FIVE full questions.*

1. (a) Explain Fleming's rules as applied to induced emf's. **(5 Marks)**

(b) Define:

i) Self inductance and

ii) Mutual inductance and obtain the relationship between these two. **(8 Marks)**

(c) Define RMS and average value of a sinusoidally varying current and find their values in terms of its peak value. **(7 Marks)**

2. (a) Show that the average power in a pure capacitive circuit with a sinusoidal voltage is zero. **(6 Marks)**

(b) A coil of power factor 0.6 is in series with a $100\mu F$ capacitor. When connected to a 50Hz supply, the potential difference across the coil is equal to the potential difference across the capacitor. Find the resistance and inductance of the coil. **(9 Marks)**

(c) Two impedances $(150 + j157)\Omega$ and $(100 - j110)\Omega$ are connected in parallel across a $220V, 50Hz$ supply. Find the total current and power factor. **(5 Marks)**

3. (a) Derive the relationship between the line and phase quantities of a balanced star connected load. **(6 Marks)**

(b) Three 100Ω resistors are connected in i) Star & ii) Delta across a 415V, 50HZ, 3-phase supply. Calculate the line and phase currents and the power consumed in each case. **(8 Marks)**

(c) Estimate the power factor in each of the following cases of two Wattmeter method of measuring three phase power:

i) Wattmeter readings are equal

ii) Wattmeter readings are equal and opposite

iii) Wattmeter readings are in the ratio 1:2

iv) One Wattmeter reads zero. **(6 Marks)**

4. (a) Explain the following :

i) Armature windings of a DC machine

ii) Commutator of a DC machine

iii) Brushes of a DC machine **(6 Marks)**

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