USN [ ][ ][ ][ ][ ][ ][ ][ ] **06ELE15/25**

First/Second Semester B.E. Degree Examination, January 2013
Basic Electrical Engineering

Time: 3 hrs. Max. Marks:100

Note:*1. Answer FIVE full questions choosing at least two from each part.*
2. Answer all objective type questions only in OMR sheet page 5 of the Answer Booklet.
3. Answers to objective type questions on sheets other than OMR will not be valued.

PART - A

1 a. Choose the correct answer : **(04 Marks)**
   i) For a given circuit of $10k\Omega$, a potential difference of 100V is applied. If the voltage is trebled and circuit resistance is increased by four times, the value of current is
   A) 10A   B) 7.5 mA   C) O A   D) 7.5A
   ii) The unit of magneto motive force (MMF) is
   A) Ampere   B) No. of turns   C) Volf - ampere   D) Ampere turns
   iii) The unit of statically induced emf is volts, then the unit of dynamically induced emf is
   A) Watts   B) Webers   C) Volts   D) Volt - ampere
   iv) Two resistances 4.4Ω, 10.5Ω are connected in parallel, the circuit is energized by 100V supply. The current flowing through 10.5Ω resistor is
   A) 20A   B) 9.25A   C) 2.5A   D) 8.92mA

   b. In a Series – Parallel circuit shown in fig. Q1(b), find
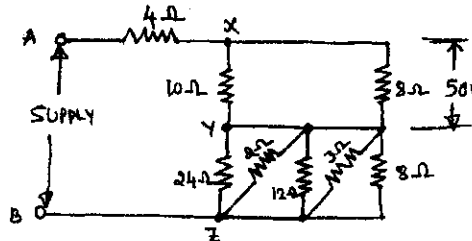   i) The voltage drop across 4Ω ii) Supply voltage.   **(08 Marks)**

Fig.Q1(b)

   c. Define the coefficient of coupling. Derive the equation for the same. Explain its effect on magnetic circuit. **(08 Marks)**

2 a. Choose the correct answer : **(04 Marks)**
   i) Which of the following devices work at unity power factor
   A) Induction motor B) Electric Iron   C) Fluorescent lamp D) Condenser bank
   ii) The equation of an alternating current is given by $i = 42.42 \sin 314t$. The form factor is
   A) 1.414   B) 3.1414   C) 1.111   D) 4.44
   iii) Two impedances $Z_1 = (150 + j\,157)\Omega$, $Z_2 = (100 - j\,110)\Omega$ are connected in parallel across 220V , 50Hz supply. The power factor of circuit is
   A) 0.978 lead   B) 0.707 lag   C) 0.707 lead   D) 0.637 lead
   iv) Power factor of AC circuit can be improved by connecting
   A) Choke   B) Synchronous motor
   C) Induction motor   D) Fluorescent lamp

   b. Obtain the expression for instantaneous voltage, current, power, power factor in case of series R-L-C circuit by considering all three cases $X_L > X_C$, $X_L < X_C$, $X_L = X_C$. Draw neat phasor diagrams in all 3 cases. **(10 Marks)**

   c. When a voltage represented by $e = 100 \sin (314t + 20^0)$ volts is applied to a series R-L circuit, the power absorbed is 800 watts and power factor is 0.7. Find R & L and write down the expression for current. **(06 Marks)**