A

EE-201

B.Tech. (Ist Year) (IInd Semester)

Examination – 2011

Electrical Engineering

Time: Three Hours

Maximum Marks: 100

Note: Attempt all Sections.

Section – A

Note: Attempt any ten questions. Each question carries four marks. **(4x10=40)**

1. Define:

   (a) Lumped and distributed circuits

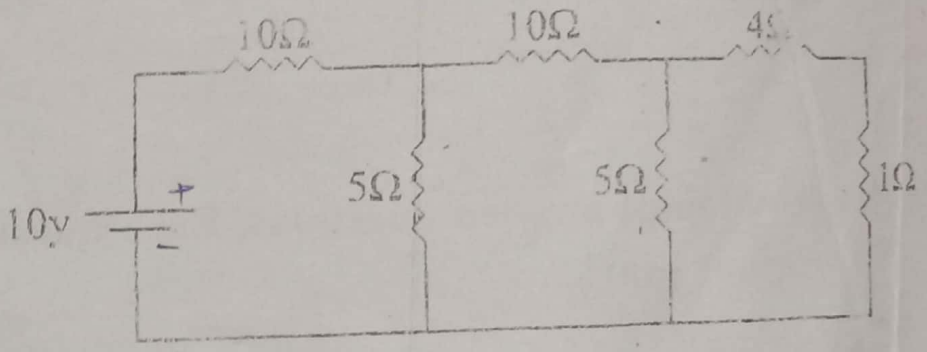
   (b) Linear and non linear circuits

2. For ac input derive the expression of current and power factor for a series R-C circuit.

3. Derive the relation between line voltage and phase voltage in a star connected 3 ϕ balanced load supply.

4. Draw the equivalent circuit of a transformer referred to secondary side and define its circuit elements.

5. Calculate the current through 1Ω resistance using loop method



6. Explain the working principle of a dc motor diagrammatically.

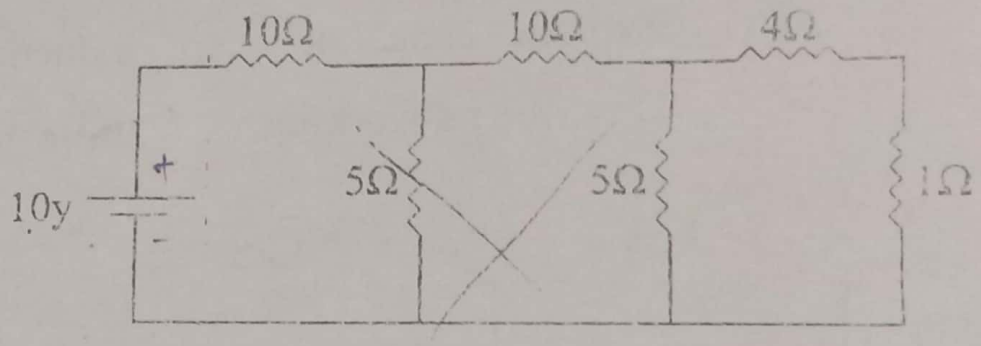
7. An inductor of resistance 10Ω and inductance of 0.6 H is in series with a capacitance 10μF. If a voltage of 200V is applied and the frequency is adjusted for resonance then find the current and voltage through capacitor.

8. If $V = 5\cos(1000t - 30^0)\,V$ and

$i = 3\cos(1000t + 10^0)A$, *then*

Identify the circuit element and find its value.

9. Determine the mesh current I_1 & I_2 by mesh method.



10. A balanced star connected load of (8+j 6)Ω per phase is connected to a balanced $3\varphi, 400V, 50Hz$ supply. Find:
(a) Line current (b) Power factor

11. Three identical resistors of 20Ω each are connected in star to a 415V, 50Hz 3φ supply. Calculate:

$\frac{\eta V_A \times \cos\phi}{\eta V_A \cos\phi + P_i + \eta^2 P_{cu}}$

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(ii) A 1000 VA transformer has a core loss of 15w and copper loss of 20w. Calculate its efficiency at 0.9 power factor logging.

6. (i) Explain the working of 3φ induction motor and write the expression of slip. $Slip = \frac{n_s - n}{n_s}$

(ii) Explain capacitor start induction motor. Describe its working. (Solve by line Phase)