

Code: R7 100506

**R7**

B.Tech I Year (R07) Supplementary Examinations, May 2012

**BASIC ELECTRICAL ENGINEERING**

(Common to CSE, IT and CSS)

Time: 3 hours

Max Marks: 80

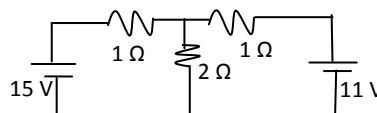
Answer any FIVE questions

All questions carry equal marks

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- 1 (a) Define (i) Electric field (ii) Electric current (iii) Electric power (iv) Electro motive force.  
(b) State and explain Kirchhoff's laws.

- 2 (a) Explain the types of passive elements in detail.  
(b) Find the current through  $2\ \Omega$  resistor using super position theorem.



- 3 (a) List out the similarities and dissimilarities between electric and magnetic circuits.  
(b) A cast steel electromagnetic has an air gap length of 3 mm and an iron path of length 40 cm. Find the number of ampere turn necessary to produce flux density of  $0.7\text{ Wb/m}^2$  in the gap. Neglect leakage and fringing.
- 4 (a) Show that peak factor of a sinusoidal current wave form is 1.414.  
(b) Show that power dissipated by a pure capacitive circuit excited by a sinusoidal source is zero.
- 5 (a) Explain the losses that occur in transformers.  
(b) A 3300/220 V, 30 KVA, 1- $\phi$  transformer takes a no load current of 1.5 A when the low voltage winding is open. The iron loss component is 0.4 A. Find (i) no load input power (ii) Magnetizing component (iii) power factor.
- 6 (a) Derive the emf equation of DC generator.  
(b) A six-pole, lap wound armature has 840 conductors and flux per pole of 0.018 Wb. Calculate the emf generated, when the machine is running at 600 rpm.
- 7 (a) Explain the principle of operation of synchronous motors.  
(b) A 12-pole 3- $\phi$  induction motor runs at 485 rpm on a 50 Hz supply. Calculate slip.
- 8 (a) Make a difference between spring control and gravity control.  
(b) Explain the principle and operation of permanent magnetic moving coil instruments with neat diagrams.

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