B.Tech I Year (R07) Supplementary Examinations, May 2011 BASIC ELECTRICAL ENGINEERING

(Common to Computer Science & Engineering, Information Technology, Computer Science & Systems

Engineering)

Max Marks: 80

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Time: 3 hours

Answer any FIVE questions All questions carry equal marks

- 1. (a) Give a detailed comparison of series and parallel circuit.
 - (b) What are the applications, merits and demerits of a series circuit?
 - (c) What are the applications and advantages of a parallel circuit?
- 2. (a) Find the equivalent resistance between the terminals X and Y in the circuit as shown in the figure 1.



Figure 1:

- (b) Describe in detail the steps to apply the enins theorem.
- 3. (a) What is meant by self inductance? Obtain the expression for the same.
 - (b) A magnetic circuit has a uniform cross sectional area of 5sq.cm and a length of 25cm.A coil of 100 turns is wound uniformly the magnetic circuit when the current in the coil is 2A,the flux is 0.3wb.Calculate
 - i. Magnetizing force
 - ii. Relative permeability
 - iii. Magnetic flux density.
- 4. (a) A coil of power factor 0.9 is in series with a 120μ F capacitor. When connected to a 50 Hz supply the potential difference across the coil is equal to the potential difference across the capacitor. Find the resistance and inductance of the coil.
 - (b) A metal filament lamp rated 750 W, 110V is to be connected in series with a capacitor across a 220V, 50Hz supply. Calculate
 - i. The capacitance required
 - ii. The power factor.
- 5. (a) Draw a no load phasor diagram and explain it.
- (b) Enumerate the various losses in a transformer. How can these losses be minimized.
- 6. (a) Give the difference between the cumulative and differentially compounded dc generator.
 - (b) A dc series generator has an armature resistance of 0.5Ω and series resistance of 0.03Ω . It drives a load of 50A. It has 6 turns per coil and total 540 coils on the armature and is driven at 1500rpm. Calculate the terminal voltage at load. Assume 4 poles lap type winding, flux per pole as 2mWb and total brush drop is 2V.
- 7. (a) Give the difference between the salient pole rotor and smooth cylindrical rotor of alternator.
 - (b) An armature of 3 phase alternator has 120 slots. The alternator has 6 poles. Calculate its distribution factor.
 - (c) In a 4 pole 3 phase alternator armature has 36 slots. Its using an armature winding which is short pitched by 1 slot. Calculate its coil span factor.
- 8. (a) Why is the scale of a MI instrument non uniform? Explain.
 - (b) With neat sketch explain the process of eddy current damping.