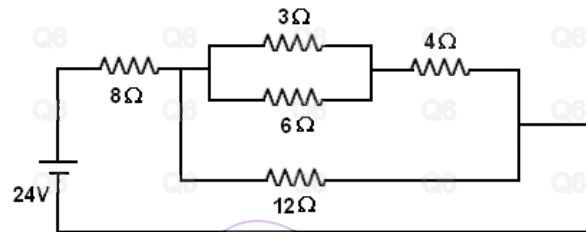


R09**Code No: 09A30504****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B.Tech II Year I Semester Examinations, May/June-2013****Basic Electrical Engineering
(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) State and explain Kirchoff's laws.
 b) Calculate the currents in individual resistors, the total power consumed and the total current by the compound circuit shown in Figure. [15]

**Figure**

- 2.a) Define Thevenin's theorem.
 b) An RL parallel circuit consists of a resistance of $12\ \Omega$ and an inductance of $0.05\ \text{H}$ connected across a $115\ \text{V}$, $50\ \text{Hz}$ source. Calculate
 i) The total current
 ii) The power factor
 iii) The true power at the circuit. [15]
- 3.a) What is meant by root mean square and average value of alternating currents and voltages?
 b) Two impedances $Z_1 = (12 + j16)\ \Omega$ and $Z_2 = (15 - j20)\ \Omega$ are connected in parallel across a $230\angle 53^\circ$ volts power source. Calculate the power in volt amperes, in reactive volt amperes and in watts in each branch and the power factor of the complete circuit. [15]
- 4.a) Explain the working principle of a transformer.
 b) A $50\ \text{kVA}$ single-phase transformer of $2300\text{V}/230\text{V}$ rating has the primary and secondary winding resistance of $2\ \Omega$ and $0.02\ \Omega$ respectively. The iron losses equal to $412\ \text{W}$. Calculate the efficiency
 i) At half full load and
 ii) At full load,
 when the power factor of the load is 0.8 . [15]
- 5.a) Derive emf equation of DC generator.
 b) A 4-pole compound generator supplies a load of $100\ \text{A}$ at a terminal voltage of $400\ \text{V}$. Calculate the generated emf of the machine if the resistance of the armature is $0.02\ \Omega$, the series field resistance is $0.04\ \Omega$ and the shunt field resistance is $160\ \Omega$. Neglect the armature reaction. [15]

- 6.a) What are the losses present in a dc machine?
b) A dc series motor having a resistance of 1Ω between terminals, runs at a speed of 800 rpm at 200 V with a current of 15 A. Find the speed at which it will run when connected in series with a 5Ω resistance taking the same current at the same supply voltage. [15]
- 7.a) Explain the working principle of three phase induction motor.
b) If a 3-phase induction motor with 6-poles runs at 970 rpm when connected to a 50 Hz supply, calculate
i) The percentage slip and
ii) Frequency of the rotor currents. [15]
- 8.a) What are the essential features of measuring instruments?
b) Explain the working principle of PMMC meter. [15]

---oo0oo---

