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Menoufia University Faculty of Engineering, Shebin El-Kom Mechanical Power Department First Semester Examination,2013-2014 Date of Exam: Sunday 5/1/2014	جامعة المنوفية	Subject: Electrical Engineering Code: ELE117 Year: First Year MPD Time Allowed: 3 hours Total Marks: 60 marks

Answer the following questions, each has the same marks:

Question1: Six similar batteries, each has 24V and 0.6Ω internal resistance are connected as: 1- series, 2- parallel, 3- matrix (2X3) to a load resistance. For each case at maximum power transfer Find : the load resistance and the maximum power transfer.

Question2: An industrial process required lifting a 10 m³ of hot water / minute at 85C° using a set of pump and electric motor. If the motor is fed from a 240 V dc supply at set efficiency is 85 % calculate: 1- the motor input power rating in Kw.   2- the motor current.

Question3: A simple series control circuit consists of two similar nonlinear resistors. If the battery voltage is 18 V and each nonlinear resistor has the following characteristics:

Volt(V)	0	2	4	6	8	9
Current(A)	0	0,1	0.2	0.5	0.9	1.5

For each resistor find: the current in, the voltage across and the power loss.

Question4: An iron ring has 2 m mean diameter, 20 Cm² cross-sectional area and 100000 relative permeability of the iron core. It wounded uniformly with 1000 turns to produce 0.003 Wb in the core. Calculate:- the required current in the winding if the ring has:
      1- no gap (i.e. L_g =0.0),   2- a gap with L_g =2Cm , B_g=Bi.

Question 5: A series R-L-C circuit operates at resonance. If L=0.5H, C=10μF and R=100Ω calculate: 1- the supply frequency   2- the supply current. .   3- the coil voltage.
        4 - the input power.   5- the reactive power of the capacitor.

Question6: Resolve Question5 if C is parallel with (R-L) to find: the supply current and power at 50 Hz.

Question 7: The reading of the ammeter in Fig.1 is 8A. While the total current, I = 15A with 45° leading angle. If the coil has X_L= 10Ω , r = 10Ω, calculate: 1- the supply voltage.
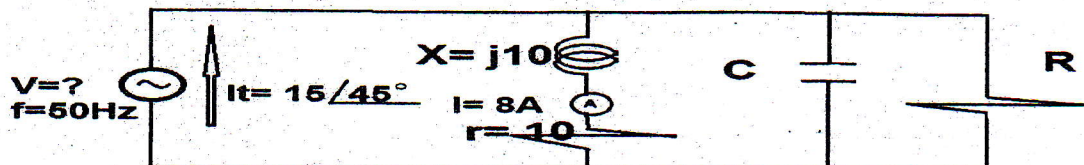2- the unknown branch currents.   3- the values of R and C. 4- the equivalent impedance.

Fig. 1

تم بحمد الله   Good luck