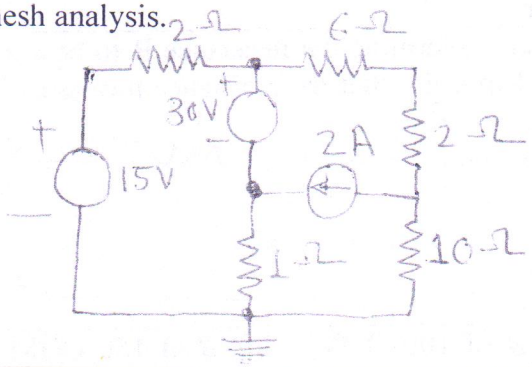
College of Engineering, Pune-05
F.Y.B.Tech.
Re-End Semester Examination-2008-2009
(EE101) Basic Electrical Circuits Re-exam

Day-Thursday
Date-14/05/2008

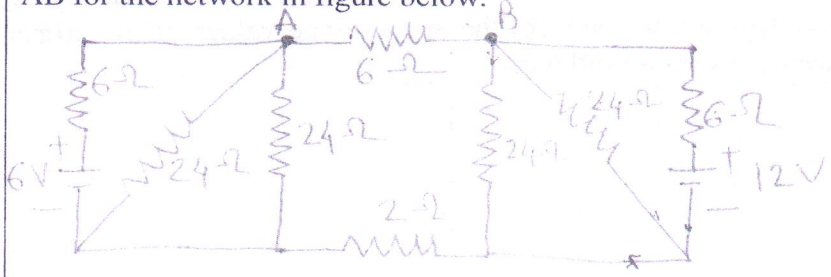
Maximum Marks-50
Time-12.00 noon to 3.00 pm.

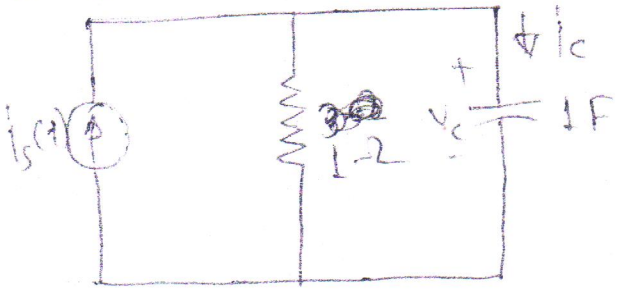
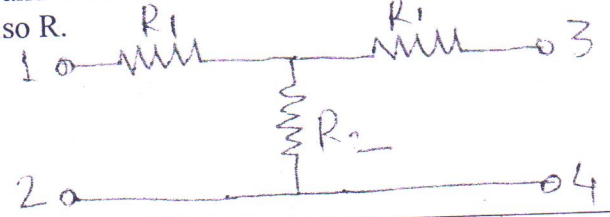
Instructions

1) All questions are compulsory.
2) Make necessary assumptions and assume suitable data whenever required
3) Only non-programmable calculators are allowed
4) Explain with diagram wherever necessary.
5) Figure to right indicate full marks.

Q.1		Solve the circuit shown below in figure for all node voltages and element currents. Use nodal analysis. Verify the results obtained for element currents by mesh analysis. 	10
Q.2	A	A magnetic circuit comprises three parts, *a*, *b*, and *c* in series, each of which has uniform cross-sectional area. Part *a* has a length of 80mm and cross-sectional area 50 mm^2. Part *b* has a length of 70mm and cross-sectional area 80 mm^2. Part *c* is an air gap of 0.5mm in length and of cross-sectional area 60 mm^2. Neglecting magnetic leakage and fringing, determine the current necessary in a coil of 4000 turns wound on part *b* to produce in the air-gap a flux density of 0.7T. The magnetic characteristic for part *a* and *b* is given by:	05

H(A/m)	100	210	340	500	800	1500
B(T)	0.2	0.4	0.6	0.8	1.0	1.2

	B	State the superposition theorem and use it to determine current in branch AB for the network in figure below. 	05

	C	Find the voltage Vc(t) and current ic(t) for the parallel RC circuit shown below in figure for the case R=1 OHM, C=1 F , and the applied current is the pulse is(t) =u(t)-u(t-1) A. 	05
Q.3	A	Show that power consumed by three identical phase loads connected in delta is equal to three times the power consumed when the phase loads are connected in star.	04
	B	In following figure determine the resistance R to be connected across the terminals 3 and 4 in order that the resistance measured between terminals 1 and 2 is also R. 	04
	C	Two resistances *A* of 100 OHM and *B* of 150 OHM are connected in series. A has a resistance temperature co-efficient of 0.004 per ^{0}C, while the resistance temperature co-efficient of B is 0.001 per ^{0}C, both at 0^0C. Find the resistance temperature co-efficient of combination at 0^0C. Assume the values of the resistance given as at 0^0C.	04
	D	Explain the construction of DC machine with aid of neat diagram showing main parts.	04
Q.4	A	Calculate the line current of a three phase (star connected) alternator delivering 5 MW at 33 kV and working at 0.8 power factor.	03
	B	Three identical resistors of 20 OHM are connected in star to a 415 V, three-phase, 50 Hz supply. (a) Calculate the power taken by the load. (b) If one of the resistor is open-circuited, calculate the power consumed.	03
	C	A 50 kVA single-phase transformer has a turns ratio of300/20. The primary winding is connected to a 2200 V, 50 Hz supply. Calculate: (a) the secondary voltage on no load, (b) the approximate values of the primary and secondary currents on full load.	03