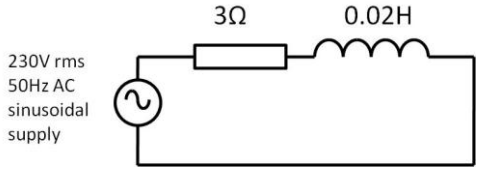
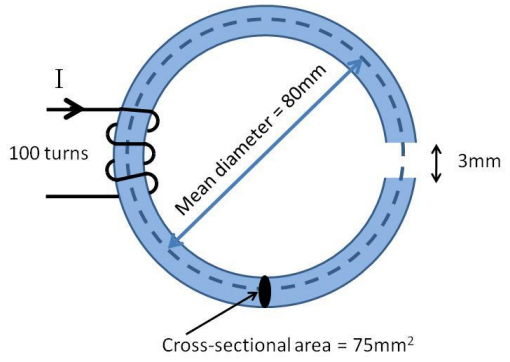
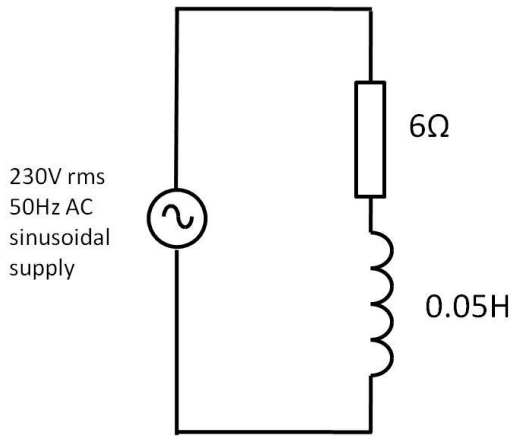
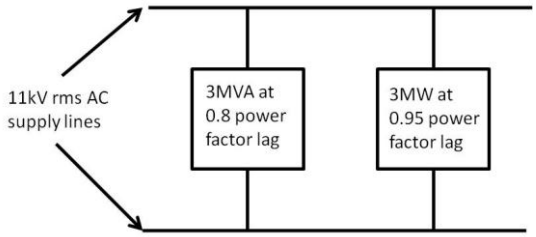
Registration number:

EEE102 Power Networks
Mid Term Test – March 2009

Constants required: $\mu_0 = 4\pi x10^{-7}$ Hm^{-1}

	Question	Answer	Marks
1	Convert the following impedances into magnitude and phase representations: i) 3 + j21 Ω ii) 4 - j3 Ω	i)	[1]
		ii)	[1]
2	Convert the following impedances into complex number representations: i) 13.3∠45° Ω ii) 27.4∠85° Ω	i)	[1]
		ii)	[1]
3	Calculate the impedance of the circuit below and the magnitude and phase of the current 	Impedance:	[1]
		Current:	[2]
4	A 100 turn coil is wound onto the circular iron core shown below. The iron core includes an airgap of length 3mm. The iron core has a fixed relative permeability of 400. Calculate the current required to achieve a flux density in the core of 1.3T. 	Include any intermediate calculations in this box and state answer at bottom of box Current:	[4]

5	Which of the following expressions defines the rms voltage for any generalised time varying voltage (a) $V_{rms} = \sqrt{\frac{1}{T}\int_0^T v^2 dt}$ (b) $V_{rms} = \frac{1}{T}\sqrt{\int_0^T v^2 dt}$ (c) $V_{rms} = \frac{V_{peak}}{\sqrt{2}}$	State (a), (b) or (c):	[1]
6	Calculate the circuit current and the VA, VAr and Watts supplied to the load 	Show all your intermediate calculations in the box and state the final answers at the bottom of the box Current : VA: VArs: Watts:	 [1] [1] [1] [1]

7	Calculate the total Watts, VA and VAr drawn by the combination of loads shown below and hence calculate the current drawn from the supply  	Show all your intermediate calculations in the box and state the final answers at the bottom of the box Watts: VA: VAr: Current drawn from supply:	 [1] [1] [1] [1]

END OF QUESTION PAPER