

Cork Institute of Technology
Bachelor of Engineering in Building Services Engineering – Stage 2
(EBSen_7_Y2)
Summer 2008
Electrotechnology
(Time: 3 hours)

Answer THREE questions from Section A
and TWO questions from Section B.
Use separate answer books for each Section.
All questions carry equal marks.

Examiner: Mr. S. Bojovic
Dr. M. Smyth
Mr. D. Leonard

Section A

- Q1. (a) A coil of insulated wire of resistance $8\ \Omega$ and inductance $0.03\ \text{H}$ is connected to an a.c. supply at $240\ \text{V}$ 50Hz . Draw the circuit and calculate:
- (i) the current through the coil
 - (ii) power factor
 - (iii) the power consumed by the coil (6 marks)
- (b) Calculate the value of capacitance which when connected in series with the above coil, causes no change in the values of the current and power taken from the supply. (6 marks)
- (c) A coil of resistance $100\ \Omega$ and inductance $100\ \mu\text{H}$ is connected in series with a $100\ \text{pF}$ capacitor. The circuit is connected to a $10\ \text{V}$ variable frequency supply. Draw the circuit and calculate:
- (i) the resonant frequency
 - (ii) current at resonance
 - (iii) voltage across L and C at resonance
 - (iv) Q factor of the circuit (8 marks)

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