

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Semester 2 Examinations 2015/16

Domestic Building Services

Module Code: BULD 6002

School: Building and Civil Engineering

**Programme Title(s): BSc (Hons) Construction Management,
BSc in Construction
BSc (Hons) Quantity Surveying**

Programmes Code(s): CCNMG_8_Y1 CCONS_7_Y1 CQTSU_8_Y1

External Examiner(s): Mr. Lawrence Slade, Dr. Mike Murray, Mr. Ger Harrington

Internal Examiner(s): Kevin Coleman

Instructions: Do any 4 full questions

Duration: 2 Hours

Sitting: Summer 2016

Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination. If in doubt please contact an Invigilator.

QUESTION 1

Calculate the quantity of water (in litres) that can be heated to 65 degrees C using a 3 KW electric heating element, given the following parameters. Initial water temperature is 10 degrees C, the heating element is switched on for 2 hours, and the heat losses from the system are 10 %.

SHC of water is 4.2 kJ/kg/degree C.

25 marks.

QUESTION 2

If the outlet at the base of a water tank is left open calculate how long it will take to discharge the water from the tank. The tank size is 3m x 2m x 1.5m high and is $\frac{3}{4}$ full. The outlet pipe is 36mm in diameter and has a coefficient of discharge of 0.9.

25 marks

QUESTION 3

- 3 (a) Outline with the aid of diagrams the design principles that underpin the use of Natural Ventilation in building design.

15 Marks

- 3 (b) Calculate the Air Changes per Hour (ACH) for a room 8M x 6M x 2.5M high, if it is has a ventilation rate of 45 litres / second, and duct velocity losses are 15%.

10 marks

QUESTION 4

- (a) Calculate the absolute pressure in pascals and the total force in Newtons acting on the face of a 20mm valve, if the manometer water height is 80mm. Atmospheric pressure can be taken as 101KPA.

10 marks

- (b) Explain with the aid of a diagram how a U-Tube Manometer can be used to measure the pressure in a gas supply line,

15 marks

QUESTION 5 (a)

Design suitable power circuits capable of efficiently distributing the following electrical loads, and taking into account that the maximum MCB size for our power circuits is 20 amps .

The electrical load is , Washing Machine 3.4kw, Tumble Dryer 2.5kw, Microwave 1 kw and Dishwasher of 1.75kw.

Voltage supply is 220 volts, and the cable to be used is a 2.5mm square cable.

15 marks

Question 5 (b)

Graphically outline and discuss how our electricity supply is distributed via the national electricity supply network.

10 marks

QUESTION 6

Describe the range of Broadband Internet services available to domestic customers in Ireland. Make reference in your answer to the operational systems, quality, availability, and cost of the various services.

25 marks