

## HIP Magazine – Winter Issue 2018 - Answer Sheet

### Pages 50-52

### Bathrooms and Showers

Complete the following multiple choice questions.

Q1: Before work commences, the local water supplier will need to be notified and give approval for:  
(tick all that apply)

- a) Baths holding more than 230 litres of water
- b) Multi head showers with a walk in shower
- c) Bidets with a flexible hose
- d) Bidets with an upward spray

Q2: There is a legal requirement to fit Thermostatic Mixing Valves (TMVs) in

- a) All existing domestic properties in England, Wales and Scotland
- b) To baths in all domestic new-build properties in England, Wales and Scotland
- c) To showers, taps, bidets and baths in all new-build domestic properties in England, Wales and Scotland
- d) To none of the above

Q3: What is the difference between TMV2 and TMV3 approved mixing valves?

- a) TMV 3 valves are manufactured to the highest specifications required by the NHS and capable of operating at a higher pressure. TMV 2 valves are for the domestic market.
- b) TMV 3 valves are the next generation of TMV 2 valves
- c) TMV 2 valves are manufactured to the highest specifications required by the NHS. TMV 3 valves are for the domestic market.
- d) It's all about size, TMV 3 valves are bigger than TMV 2 valves.

Q4: Should the entrance to the showering area:

- a) **Have no threshold**
- b) Incorporate a no 'track' or frame across the entrance
- c) Incorporate a low-level shower tray
- d) Incorporate a shower tray with a height no larger than 20mm

Q5: What bathroom appliances fall under fluid category 5:

- a) **WCs**
- b) Bath
- c) Washbasin
- d) **Over rim type bidets**

Q6: What bathroom appliances fall under fluid category 3:

- a) WCs
- b) **Bath**
- c) **Washbasin**
- d) Over rim type bidets

Q7: In backflow prevention for a WC, how big should the air gap be between the overflow on the cistern to the spill-over level of the WC pan?

- a) 200mm
- b) 250mm
- c) **300mm**
- d) 350mm

Q8: When installing a TMV2 to feed a bath in a home where there are very young, very old or vulnerable inhabitants, it is best to install the TMV2 in a position:

- a) As close to the hot water outlet of the hot water cylinder as possible
- b) Within the kitchen near the cold water mains stop valve
- c) **Underneath the bath in an accessible position to limit dead legs.**
- d) Hidden behind boxing making the TMV2 permanently inaccessible to avoid tampering.

**Which of the following statements are true or false:**

Q9: True or false: Shower mixing valves fed from a storage cistern do not require equal pressures on both the hot and cold supplies to maintain the correct mixing ratio of hot and cold water.

**Answer: False, this type of system needs equal pressure to mix the correct ratio of water, therefore TMVs are the safest valves to use.**

Q10: True or false: The cold feed from the cold water storage cistern to the shower pump must be fitted above the cold feed to the hot water cylinder.

**Answer: False, if this was the case then the cold water would run out before directing the hot at the shower outlet and therefore increase the risk of scalding.**

Q11: True or false: A shower head which has been installed on a long shower hose that can come into contact with the toilet is a category 3 risk.

**Answer: False, this is a category 5 risk.**

Q12: True or false: Showers installed on an instantaneous hot water system (combi boilers etc) need to include a pressure compensating shower valve to compensate for the loss of pressure and flow rate experienced as the water passes through the boiler/water heater.

**Answer: True, Pressure balanced or compensating showers take up and react to the varying flow from mains or as other outlets are opened in the property**

Q13: True or false: Many shower trays have a raised lip that can be placed against the wall to ensure your tiles are straight.

**Answer: False, the lip is there to allow tiles to be placed over the top to allow for a better seal.**

Q14: True or false: Sanitary pipework and drainage systems must comply with Approved document g, sanitation, hot water safety and water efficiency

**Answer: False, its Approved Document H, drainage and waste disposal.**

Q 15: True or false: Birds should be prevented from nesting on top of soil stack vent pipes in case the nests block off the air supply to the stack. This can cause the loss of the trap seal.

**Answer: True**

## **Pages 54-56**

### **Water Treatment, filters, Conditioners and Meters**

**Complete the following multiple choice questions.**

Q1: In regards to water treatment, what can build up in a heating and hot water system if they are left untreated?

- a) Black dust
- b) Carbon Monoxide
- c) Corrosion and limescale**
- d) Algae

Q2: Water treatment should be used:

- a) Only when a new boiler is installed
- b) Only when a boiler is maintained
- c) Only when a boiler breaks down
- d) In every new installation and as part of a regular maintenance routine

Q3: What of the following statements is not true?

Limescale and corrosion:

- a) Can increase energy costs and carbon emissions
- b) Can lead to boiler breakdown
- c) Can invalidate the warranty and devalue the appliance
- d) Can increase water flow

Q4: What has to come into contact to cause corrosion?

- a) Sludge, water and dissolved oxygen
- b) Bare metal, water and dissolved oxygen
- c) Bare metal, sludge and water
- d) Dissolved oxygen and metal swarf

Q5: What pH range provides stable conditions for all metals likely to be found in heating systems if including Aluminium?

- a) pH 6.5 – 8.5
- b) pH 4 – 6
- c) pH 7.5 – 9.5
- d) pH 6 – 8

Q6: What is the function of a high quality chemical cleaner?

- a) To remove metal oxide particles from the system

- b) To remove flux residues from the system
- c) To remove dissolved oxygen from the system subsequently dosed inhibitor to function fully
- d) To remove debris and foulants, and allow the subsequently dosed inhibitor to function fully.

Q7: What significantly increases the rate of corrosion in untreated water?

- a) Minor flux residues
- b) Excess dissolved oxygen
- c) Excess water
- d) Metal oxide particles

Q8: Limescale forms when (mainly) calcium bicarbonate precipitates out of water. What is the ideal temperature for Limescale to typically form:

- a) 30 –35°C and progressively worsens as temperatures fall.
- b) 45 –55°C and progressively worsens as temperatures rise.
- c) 35 –40°C and progressively worsens as temperatures rise.
- d) 31 –41°C and progressively worsens as temperatures fall.

Q9: From the following list select two permanent limescale prevention solutions:

- a) Powerflushing
- b) Ion exchange water softeners
- c) Driven electrolytic scale inhibitor devices
- d) Adding sodium chloride to the system

Q10: How do Electrolytic scale inhibitors work?

- a) Electrolytic devices work by delivering low levels of zinc and copper into the system which suppresses limescale formation.
- b) Electrolytic devices work by delivering a low level electric pulse into the system which suppresses limescale formation.

c) Electrolytic devices work by delivering low levels of electrolytes into system which suppresses limescale formation.

d) Electrolytic devices work by delivering low levels of sodium chloride into system which suppresses limescale formation.

Q11: The Domestic Heating Compliance guide it states that “Central heating systems must be thoroughly cleaned and flushed out before installing a new boiler”

Answer: True

Q12: Tick the following statements that are true. You should:

a) Find a system cleaner you like and aim to use the same type of cleaner on all systems.

b) Assess the age of the boiler, the type of soiling and the level of debris in the system before you choose a cleaner.

c) Just give the system a Powerflush, cleaners are a waste of money.

d) Never use one type of cleaner on all systems.

Q13: Tick the following ways a system can lose its inhibitor

a) Due to partial draining and re-filling with raw mains water

b) Leaks which require the system to be refilled with raw mains water

c) Poor system design

d) Oxygen ingress.

Q14: How do you check inhibitor concentration levels?

a) Just add more anyway, if a system hasn't been maintained for a while, it probably needs inhibitor.

b) Use a PH test kit

c) Use any inhibitor test kit

d) Use an inhibitor test kit from the manufacturer of the inhibitor used in the system.

## Pages 58-60

### Domestic Hot Water and Water Heaters

#### Open questions:

Q1: What are the three main types of hot water systems?

A: Open vented, unvented and combination boilers

Q2: At what minimum temperature should hot water be stored to kill legionella?

A: 60°C

Q3: What is the minimum temperature at which hot water should circulate to kill legionella and other harmful bacteria?

A: Hot water should be stored at least at 60°C and distributed so that it reaches a temperature of 50°C (55°C in healthcare premises) within one minute at the outlets

Q4: What component does not usually make up part of an indirect open vented hot water system?

A: Hot water cylinder

B: Cold water storage cistern

C: Vent pipe

D: Pressure Relief valve

Q5: In open vented systems, what has the main effect on the water pressure that is delivered to the outlets?

A: Gravity - so the height of the cold water tank will dictate the available pressure 0.1bar per 1m of head

Q6: In unvented hot water systems, what role do the following components play?

a) Pressure reducing valve

b) Line strainer

c) Expansion vessel

d) Temperature and pressure relief valve

e) Tundish

Answers:

a) Reduces water pressure slightly on the incoming cold water main pipe and keeps pressure at a constant level. The rating of the pressure reducing valve is less than the expansion relief

b) Filters out particles from the incoming cold water main that may come in from the cold water system.

c) This ensures the system operates safely as the water inside has space to expand.

d) Removes pressure from the system and discharges water in the event of serious over pressurization or rise in temperature.

e) Will help alert to system faults, as water will discharge through the tundish giving a visual warning.

Q7: To comply with the Building Regulations for England and Wales, The Water Supply (Water Fittings) Regulations and the Scottish Water Bye-laws, an unvented hot water system with a storage vessel must incorporate precautions to:

a) prevent the temperature of the water stored in the vessel at any time exceeding 100°C; and

b) ensure that any discharge from safety devices is safely conveyed to where it is visible but will not cause a danger to persons in or about the building.

What should be installed to safely discharge the water in the event of serious overheating?

A: A temperature relief valve or a combined temperature and pressure relief valve.

**Which of the following statements are true or false:**

Q8: The nominal set temperature range at which temperature and pressure relief valves are set is between 90-95°C.

A: True

Q9: True or false: Under controlled temperature conditions, safety relief discharge pipework from unvented hot water storage systems up to 410 litres (500 litres nominal) capacity can be drained into plastic sanitary pipework.

A: True

Q10: True or false: Vented systems do not need safety relief discharge pipework like unvented systems as the vent pipe and tank provide an escape route for excess water created by heat expansion.

A: True

Q11: True or false: Safety devices on unvented hot water storage systems should be checked every 2 years.

A: False, checks should be made annually.

Q12: True or false: Combi boilers are a type of instantaneous hot water system.

A: True, combi boilers deliver hot water on demand without the use of tanks.

Q13: True or false: Gas-fired instantaneous hot water systems produce lower flow rates than electric ones.

A: False, gas fired systems tend to deliver better flow rates.

Q14: True or false: Instantaneous hot water systems are better for larger homes with multiple bathrooms.

A: false, a vented or unvented system is better for larger properties with multiple bathrooms due to the increased demand on the water.

## Off Gas Mains Heating, Including Oil, LPG and Electric

Complete the following multiple choice questions.

Q1: Which heating fuel involves burning wood:

- a) LPG
- b) Solar thermal
- c) Electricity
- d) Biomass

Q2: Propane based Liquid petroleum gas (LPG) is compressed and stored in liquid form. This reduces the gas by:

- a) 174 times
- b) 247 times
- c) 274 times
- d) 347 times

Q3: Which of the following is not a solid fuel?

- a) Anthracite
- b) Oil
- c) Coke
- d) Coal

Q4: What training course covers the installation of oil fuel storage systems and supply systems connected to fixed combustion appliances?

- a) OFT10-600a
- b) CCN1

c) ACS

d) CEN1

Q5: When designing a heating system, what is the first task from the selection below that you must carry out:

a) Calculate the primary heating pipework size

**b) Calculate the full heat loss of the building**

c) Select the correct radiator size

d) Calculate the correct size of central heating pump

Q6: Those wishing to install an oil-fired heating system should be registered with which Competent Person Scheme:

a) GasSafe

**b) OFTEC**

c) CIPHE ACP Scheme

d) HETAS

Q7: What part of the building regulations covers solid fuel appliances:

a) Part L

b) Part G

**c) Part J**

d) Part P

Q8: Energy efficiency is covered by what Part of the Building Regulations?

a) Part F

b) Part G

c) Part L

d) Part P

Non-gas heating keywords anagrams

Can you work out what these non-gas fuel types and appliances are?

Technicality merges sets

Electric heating systems

Shoestring earth gate

Night storage heaters

Asthma roller

Solar thermal

Miss boa

Biomass

Cheerfully song led

Hydrogen fuel cells

Thump peas

Heat pumps

Chairwomen banded poet

Combined heat and power

Wiper down

Wind power

Correctly hide

Hydroelectric

Accompanying referee ferret tic

Energy Performance Certificate

Perquisite glum load

Liquid Petroleum Gas

Boiled frier oil

Oil fired boiler