

## HIP Magazine – Autumn Issue 2018 - Answer Sheet

### Page 62 – Anagrams

Can you work out what these pipework, pumps, fittings and valve themed anagrams are?

X12

Talcum pricing up

Shuteye deployed imminently

Epic popper

Spas love TV

Driven off lava

Epic deed flop

Flopper wipe

Chicken leg valve

Misfitting antler

Mexican port bloom

Earthmoving exalts victim

Massive vexing whorl

Circulating pump

Medium density polyethylene

Copper pipe

Stop valve

Drain off valve

Cold feed pipe

Overflow pipe

Single check valve

Terminal fittings

Monobloc mixer tap

Thermostatic mixing valve

Shower mixing valves

## Page 64 – Wordsearch

Can you find the hidden tools and testing equipment words?

P	I	P	E	C	U	T	T	E	R	E	R	P	T	S	M
I	H	I	S	C	O	N	V	E	A	T	O	R	A	K	A
P	S	P	A	N	N	E	R	G	D	A	B	E	P	H	N
E	B	E	T	W	E	S	P	L	I	E	R	S	E	A	H
S	X	C	O	I	L	S	R	M	A	L	A	S	M	P	O
H	P	L	P	E	W	O	R	K	T	O	T	U	E	L	L
E	O	E	S	T	I	L	L	S	O	N	S	R	A	L	E
A	S	A	W	I	R	D	N	G	R	L	O	E	S	D	C
R	D	N	S	M	M	E	Z	O	V	L	M	T	U	R	O
S	I	E	N	D	E	R	F	G	A	U	G	E	R	A	V
I	W	R	E	N	C	H	O	G	L	E	R	S	E	I	E
A	C	A	T	E	M	F	L	L	V	E	H	T	S	N	R
J	P	I	P	E	B	E	N	D	E	R	T	P	H	R	K
O	Q	C	O	N	T	R	O	L	K	O	N	U	E	O	E
O	L	I	V	E	P	U	L	L	E	R	M	M	A	D	Y
S	T	O	P	T	A	P	K	E	Y	I	G	P	R	S	S

- Pipe cutter
- Manhole cover key
- Stop tap key
- Olive puller
- Spanner
- Stillson
- Pipe cleaner
- Drain rods
- Pressure test pump
- Pipe shears
- Pipe bender
- Pliers
- Solder
- Tape measure
- Gauge
- Radiator valve key
- Wrench

**Page 66 – Domestic heating systems, boilers and controls crossword**

1 C	8A	R	B	O	N				10C							
	E								I			11M				
	R							2P	A	R	A	S	I	T	I	C
	A					9F			C			C				
	T				L				U			R				
	I				U				L			O		12T		
3C	O	L	D	F	E	E	D		A			B		H		
	N								T			O		E		
									O			R		R		
				4	R	I	M	A	R	Y		E		M		
				P										O		
5	E	A	T	E	X	C	H	A	N	G	E	R		S		
H														T		
6B	O	I	L	E	R	L	O	C	K	O	U	T		A		
														T		
		7E	X	P	A	N	S	I	O	N	V	E	S	S	E	L

Across:

1. LCS tube is used in heating systems and gas pipework (amongst other uses) due to its strength, rigidity and resilience. It is made from a mixture of iron and \_\_\_\_\_ (6 letters)
2. \_\_\_\_\_ (9 letters) or one pipe circulation is circulation that occurs within the same pipe.
3. It's easy to remember the relationship between the cold feed, vent pipe and pump by using the VCP acronym; **V**ery **C**orrect **P**rocedure or **V**ent, \_\_\_\_\_, **P**ump (4 letters, 4 letters).
4. \_\_\_\_\_ (7 letters) water can be found in the boiler, central heating system or an indirect-type hot water storage cylinder. It is called so,

because it is heated by the primary source of heating and hot water within the premises.

5. A \_\_\_\_\_ (4 letters, 9 letters) is a device or vessel that transfers heat from one water system to another, without the two systems coming into contact with each other.
6. \_\_\_\_\_ (6 letters, 7 letters) is a process where a thermostat protects a boiler from overheating by shutting it down.
7. The \_\_\_\_\_ (9 letters, 6 letters) allows the safe expansion of water.

Down:

8. \_\_\_\_\_ (8 letters) of the water is one of the biggest causes of corrosion in heating systems.
9. Central heating appliances need one to safely remove the products of combustion: \_\_\_\_\_ (4 letters).
10. The \_\_\_\_\_ (10 letters) must be positioned with care to avoid design faults that could lead to problems with corrosion.
11. The \_\_\_\_\_ (9 letters) system is a form of two-pipe system that uses a small bore pipe to feed heat emitters.
12. Under Boiler Plus, timers and room \_\_\_\_\_ (11 letters) are an explicit requirement in ALL gas and oil system installations.

### Page 67 – Cold water key words

1. Potable
2. Wholesome
3. Trunk main
4. Principle main
5. Bore hole
6. Sterilisation
7. Ferrule
8. Permeation
9. Back flow
10. Dezincification
11. Water meter
12. Scale reducer
13. Weir cup
14. Cold water storage cistern
15. Float operated valve

### Page 68 – Tools and equipment

1. What piece of equipment is used to measure the flow rate of water from a tap?  
A- Flue gas analyzer  
B- Multimeter  
**C- Weir gauge**  
D- Pressure gauge
  
2. A piece of equipment that is used to measure gas pressure?  
**A- Manometer**  
B- Multimeter  
C- Electronic Weir gauge  
D- Potentiometer
  
3. A piece of equipment that is used to measure voltage?  
**A- Multimeter**  
B- Flue gas analyzer  
C- Weir gauge  
D- Potentiometer

4. What piece of equipment would you use to test flue gases and measure complete combustion?  
A- Multimeter  
**B- Flue gas analyzer**  
C- Weir gauge  
D- Potentiometer
  
5. What piece of equipment would you use to test flow and return temperatures of a two-pipe radiator system?  
A- Multimeter  
B- Flue gas analyzer  
C- Weir gauge  
**D- T1 T2 Thermometer**

### **Page 69 – Heating**

1. It is 'expected practice' to balance a domestic heating system: **True**
2. I do not need to balance a heating system if TRV's are fitted? **False**
3. Balancing a heating system improves efficiency and reduces fuel consumption: **True**
4. Which type of boiler plus measure requires an outside temperature sensor?  
A- Load compensation  
**B- Weather compensation**  
C- Flue gas heat recovery  
D- Programmable room thermostat
5. Is it a legal requirement to comply with the boiler plus scheme: **True**
6. What type of boiler plus measure utilises the waste heat within the flue exhaust gases to preheat the domestic hot water?  
  
A- Load compensation  
B- Weather compensation  
C- Boiler preheat device  
**D- Flue gas heat recovery (FGHR)**

7. What type of heat only boiler includes an integral pump and expansion vessel?
- A- Combination boiler
  - B- System boiler**
  - C- Regular boiler
  - D- Heat pump
8. Typically warm water underfloor heating flow temperatures are lower than radiators: **True**

### **Page 70 – Pumps**

1. Name some examples where a negative head shower pump would be required?
- A- Anywhere with a solenoid valve such as an electric shower or dishwasher
  - B- anywhere where pumped hot water meets the mains cold water
  - C- Where two single impeller pumps are used in the same installation as an electric showers
  - D- All of the above**
2. What is the maximum amount of flow that can be pumped from the mains in the U.K. according to the Water Supply and Fittings Regulations 1999?
- A- 12 ltr/min**
  - B- 10 ltr/min
  - C- 12 gal/min
  - D- 15 ltr/min
3. What is the maximum theoretical head of pressure of a 6m head pump in kPa?
- A- 55kPa
  - B- 65 kPa
  - C- 75 kPa
  - D- 60 kPa**

4. When you fit 2 pumps in series the following is applicable?
- A- The maximum available head of pressure increases
  - B- The maximum available flow is increased
  - C- It will not work
  - D- The power consumption does not increase
5. When you fit 2 pumps in parallel the maximum available flow is increased: **True**
6. When using a pump curve to size a central heating pump, what two things do you need to know?
- A- Index pressure loss, total flow quantity
  - B- Total water content, pipe material
  - C- Boiler type, radiator type
  - D- Power supply voltage, pipe material
7. If the hot and cold pipework from the shower pump rises into the loft space and is level or less than the manufacturers recommended minimum distance below the base of the cold water cistern, which type of pump MUST be used?
- A- Positive head pump
  - B- Negative head pump
  - C- Recirculating pump
  - D- Fish tank pump
8. When connecting the cold and hot feed to the shower pump from the CWSC, you MUST ensure that the cold outlet connection to the cylinder from the CWSC is above the cold water outlet connection from CSWC to the pump: **True**

### **Page 71 – Pipework**

1. Which pipe diameters below are not a recognized size for copper pipe in the UK?
- A- 10mm
  - B- 15mm
  - C- 22mm
  - D- 28mm
  - E- 31mm
2. You are allowed to connect plastic pipework directly to gas and oil boilers: **False**



3. When selecting the incorrect or undersized pipework for a central heating system the following problems may occur?
- A- Excessive streaming noise
  - B- Cavitation of the pump
  - C- Insufficient heat to the radiators or Underfloor heating system
  - D- All of the above
4. Which calculation method and British Standard assists the calculation of the pipe size for domestic cold water service pipework?
- A- BS EN 806
  - B- BS EN 906
  - C- BS EN 1006
  - D- None of the above
5. When installing cold water pipework within an enclosed heated space such as under the floorboards on the first floor of a house, you MUST insulate the pipework to prevent excessive heat gain. Domestic cold water pipework that is heated up to between 20 °C and 50 is at risk of legionella growth: **True**
6. Plastic pipework used for an underfloor heating system must include an oxygen diffusion barrier: **True**
7. When selecting the pipework for the D2 discharge pipework in an unvented hot water system, you must ensure the pipework is suitable for withstanding the temperatures in excess of 95°C: **True**
8. In an unvented hot water system which pipe is larger D1 or D2?
- A- D1
  - B- **D2**

## **Page 72 – Valves**

1. When installing a typical S Plan, what type of valves do you need to install?
- A- 1x 3 port motorized valve
  - B- **2x 2 port motorized valve**
  - C- 1x 4 port motorized valve
  - D- 2x 5port motorized valve

2. When installing a typical Y plan, what type of valve do you use?
- A- 3 port motorized valve
  - B- 2 port motorized valve
  - C- 4 port motorized valve
  - D- None of the above
3. What type of valve must you install before an outside tap to prevent backflow?
- A- Single check valve
  - B- Double check valve
  - C- Motorized valve
  - D- Anti gravity valve
4. What type of thermostatic mixing valve must you fit on the hot and cold water services to a basin within a hospital?
- A- TMV3
  - B- TMV2
  - C- Blending valve
  - D- None of the above
5. What type of valve protects a heating system from excessive system water pressure?
- A- Pressure relief valve
  - B- Pressure reducing valve
  - C- Temperature relief valve
  - D- None of the above
6. This valve ensures that a minimum volume of water circulating through boilers and pumps.
- A- Temperature differential valve
  - B- Automatic bypass valve
  - C- TRV
  - D- PRV
  - E- None of the above

7. Many wood burning or solid fuel appliances, such as biomass boilers or wood burning stoves require a minimum return temperature to the appliance to prevent condensing, as well as to work more efficiently. A common valve used for this use is a?
- A- Laddomat
  - B- Auto bypass valve
  - C- 2 port motorized valve
  - D- Pressure reducing valve
8. A combination valve which is installed on the cold water feed pipework before an unvented hot water cylinder includes the following components...
- A- Pressure relief valve, double check valve, pressure reducing valve
  - B- Pressure relief valve, single check valve, pressure reducing valve
  - C- Pressure relief valve, anti-gravity valve, pressure reducing valve
  - D- Anti-gravity valve, pressure reducing valve, single check valve
  - E- None of the above

**Page 73 – Tea break time – Hazardous substances**

L	R	B	Q	Q	R	G	C	Q	H	L	N	W	R	S
G	U	K	V	W	E	D	V	O	P	I	F	W	S	E
N	U	F	F	J	G	B	F	A	S	B	T	L	N	I
I	I	L	M	O	U	I	C	K	Y	H	E	G	N	R
N	Y	R	D	R	L	K	C	K	E	B	H	S	N	O
R	C	Z	X	A	A	Y	M	V	A	L	T	O	W	G
A	E	B	V	G	T	H	I	L	E	R	I	V	O	E
W	A	P	I	Q	I	S	O	E	U	C	F	O	X	T
D	T	N	D	N	O	F	R	C	W	Y	Q	T	I	A
B	G	N	U	R	N	Y	T	T	Y	C	J	Q	D	C
A	W	K	R	R	S	I	T	N	C	U	Z	C	I	T
E	F	O	V	V	O	J	J	F	E	B	K	E	S	R
H	C	S	T	N	E	M	S	S	E	S	S	A	I	I
N	F	L	A	M	M	A	B	L	E	P	B	X	N	S
T	N	A	T	I	R	R	I	T	O	X	I	C	G	K

ASSESSMENT

CATEGORIES

CORROSIVE

COSHH

FLAMMABLE

HARMFUL

INSTRUCTION

IRRITANT

LABELS

OXIDISING

PACKAGING

REGULATIONS

RISK

TOXIC

WARNING