

HIP Magazine – Summer Issue 2017 - Answer Sheet

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1) Which one of the following appliances should have its own separate connection to the consumer unit?

- a) **An immersion heater.**
- b) An electric fire.
- c) A bathroom light.
- d) A freestanding fan heater.

2) The normal voltage of the electric supply to a dwelling is:

- a) 110 V alternating current.
- b) **230 V alternating current.**
- c) 250 V direct current.
- d) 400 V alternating current.

3) The miniature circuit breaker in a consumer unit for a ring main circuit in a dwelling is usually rated at:

- a) 30 amps.
- b) 18 amps.
- c) 20 amps.
- d) **32 amps.**

4) Pipework that is not earthed by the main bonding conductor to the property should be earthed by providing:

- a) Short circuits.
- b) Bypass circuits.
- c) Complimentary bonding.
- d) **Supplementary bonding.**

5) Which one of the following appliances in a dwelling usually requires a 1.5 mm² heatproof flex?

- a) An electric shower.
- b) **An electric immersion heater.**
- c) A central heating pump.
- d) A macerator type WC.

6) Which one of the following should not be positioned within reach of a person using a bath or shower?

- a) Pull cord light switch.
- b) Macerator type WC.
- c) Standard rocker plate switch.**
- d) Shaver supply unit.

7) In addition to main equipotential bonding of services within a building, cross bonding may also be required where:

- a) Metal pipes of different materials are used e.g. copper and steel.
- b) The different services enter the building at widely spaced points.
- c) Plastic waste systems are used.
- d) Metal pipework is joined by plastic connectors.**

8) A rubber grommet would be used where:

- a) A cable passes through a plaster ceiling.
- b) A cable passes through holes in metal plaster boxes.**
- c) A cable clip passes over a cable.
- d) A cable passes through a hole in a plastic box.

9) Cables buried in plaster walls should:

- a) Not be less than 6 mm² cross section area.
- b) Clipped at intervals of not less than 300 mm.
- c) Be protected by a metal or plastic sheath.**
- d) Be single-core insulated.

10) The main wiring connections for the components of a fully pumped heating system are connected up using a:

- a) Double pole switch.
- b) Miniature circuit breaker.
- c) Wiring centre.**
- d) Consumer unit.

11) What equipment is used when carrying out the safe Isolation procedure of an electrical circuit?

- a) **An approved voltage indicator to GS 38.**
- b) A multi meter to GS 38.
- c) A neon screwdriver to GS 38.
- d) A lamp holder with leads and a lamp to GS 38.

12) A new electrical circuit installation should be tested:

- a) In a 'live' condition to provide a working condition test.
- b) First as a visual inspection with the supply off, then tested with the supply on.
- c) First for earth continuity with the supply on and then visually inspected.
- d) **Before connecting up to the supply.**

13) Which one of the following tests will establish whether the conductors to a fused spur outlet have been connected to the correct terminals?

- a) **Polarity test.**
- b) Earth continuity test.
- c) Insulation resistance test.
- d) Ring circuit continuity test.

14) Which one of the following electrical appliances requires its own separate electrical circuit?

- a) Motorised valve for central heating.
- b) Room thermostat.
- c) **Immersion Heater.**
- d) Cylinder thermostat.

15) It would be necessary to advise the customer of the need to isolate the supply at the consumer unit when carrying out the following work:

- a) **Permanently decommissioning an electric shower.**
- b) Replacing a central heating pump wired from a fused connection unit.
- c) Replacing a room thermostat to a heating system.
- d) Servicing a boiler supplied from a fused connection unit.

16) A spur is described as a:

- a) Three-pin socket outlet to a boiler.
- b) Method of fixing electrical cabling.
- c) Method of isolating a consumer unit.
- d) Branch from a ring main circuit.**

17) The incoming supply to a domestic consumer unit is known as

- a) Three phase a.c.
- b) Single phase d.c.
- c) Single phase a.c.**
- d) Single phase d.c.

18) You notice damage to the main supply cable to the property during installation work. Which one of the following would be the most appropriate action?

- a) Contact the electricity supply company.**
- b) Carry out a repair to the cable.
- c) Ignore it and carry out your work. .
- d) Turn off the supply at the meter.

19) What would a capacitor would be fitted in?

- a) An immersion heater
- b) A consumer unit
- c) A socket outlet.
- d) A central heating pump.**

20) The wires in a three core flex are colour coded: Brown, yellow and green, and:

- a) Blue.**
- b) Red.
- c) Black.
- d) White.

21) What test would you use an approved voltage indicator for?

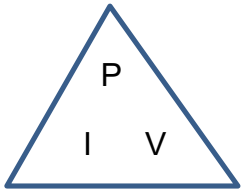
- a) Insulation resistance testing.
- b) Earth continuity.
- c) Safe electrical isolation.**
- d) Measuring current.

22) What type of switch must be fitted inside of the bathroom to isolate an electric shower?

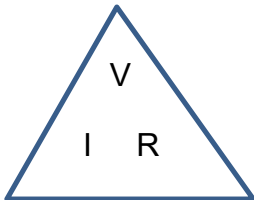
- a) A 5amp pull cord switch.
- b) A switched fused spur with a neon indicator.
- c) A 20 amp double pole switch with a neon indicator.
- d) A 45 amp double pole pull cord switch with a neon lamp and an indicator.**

23) What type of cable would be used for a ring main supplying six 2 gang socket outlets in a house?

- a) 1.5^{mm²} twin and earth cable.
- b) 4.0^{mm²} twin and earth cable.
- c) 6.0^{mm²} twin and earth cable.
- d) 2.5^{mm²} twin and earth cable.**



Power Law Triangle.



Ohms Law Triangle.

Voltage (Volts) = V

Current (Amps) = I

Power (Watts) = P

Resistance (Ohms Ω) = R.

To use the ohms and power law triangle cover up what you need to find and always write the formula down when carrying out any calculations (you will be given a minimum of two values).

Letters above will mean that you divide and letters adjacent will mean that you multiply.

For instance: $I = P \div V$ and $V = I \times R$.

24) Calculate the fuse rating (in amps) of an 8 Kw (230 volts supply) electric shower.

$I = P/V$ (8Kw =8000 watts) $8000/230 = 34.7$ (rounded up) is 35amps.

25) Calculate the resistance of the element (in ohms Ω).

$R = V/I$ $230/35 = 6.57\Omega$.

26) What would happen to the current if the resistance was found to be a lower value?

If the resistance of the element was found to be 5 Ω ? $I = V/R$ $230/5 = 46$ amps.

27) What would happen to the fuse if this was the case?

Due to excessive current being drawn, the fuse will fail therefore the shower would stop working.

28) What tests are normally carried out before a supply is connected to a circuit?

- a) Polarity.
- b) Earth Continuity.
- c) Insulation Resistance.
- d) All of the above.**

29) What voltage would be found between the live and earth connections of a live circuit in a house?

- a) 0 volts.
- b) 230 volts.**
- c) 110 volts.
- d) 130 volts.

30) What is the frequency of an electricity supply measured in?

- a) Amps.
- b) Watts.
- c) Hertz.**
- d) Joules.

Test your knowledge with the unvented test

- 1) Name the 3 building regulations un-vented hot water cylinders are subject to?
 - G3 of the building regulations
 - Part L
 - Water supply(water fittings) regulation 1999

- 2) When linking an unvented boiler to a heat sources, which fuel should not be used?
 - Electricity
 - Gas
 - Oil
 - **Solid fuel**

- 3) When choosing or replacing an immersion heater for an unvented cylinder it must comply to BS EN 60335-2-73 and contain a;
 - Bi metallic strip
 - User thermostat and non-resetting thermal cut out (**G3 3.29**)
 - User thermostat and self-resetting thermal cut out
 - Night switch for economy 7

- 4) An unvented storage cylinder must never exceed what temperature
 - 60 degrees
 - 85 degrees
 - **100 degrees**
 - 95 degrees

- 5) The discharge pipe D1 should be;
 - **At least the same size as the temperature relief valve (G3 3.51)**
 - One size larger than the temperature relief valve
 - One size less than the temperature relief valve
 - The same size as D2 pipe

- 6) The maximum length of pipe between the temperature/pressure relief and the tundish is;
- 500mm
 - 300mm
 - **600mm (G3 3.54)**
 - 700mm
- 7) The vertical section of pipe below a tundish before any bend or elbow should be
- 500mm
 - 600mm
 - **300mm G3 3.56**
 - 1000mm
- 8) D2 pipe should have a continuous fall of at least;
- 1 in 300
 - **1 in 200 G3 3.56 b**
 - 1 in 500
 - 1 in 20
- 9) Where a single common discharge pipe serves more than one system it should be at least
- The same size as the largest D2 pipe
 - **One size larger than the largest D2 pipe G3 3.59**
 - You cannot have a common discharge pipe
 - Two sizes larger than the largest discharge pipe
- 10) When connecting a discharge pipe to a soil stack, the branch must have;
- An independent branch pipe to the soil stack **G3 3.60**
 - You can use the same branch pipe from another sanitary appliance
 - You can fit the D2 pipe to a washing machine stand pipe
 - Only metal pipes can be used
- 11) Termination of the discharge pipe needs to be considered to prevent risk to persons in the vicinity; an appropriate discharge point would be;
- A trapped gully with the end of the pipe below a fixed grating and above the water seal
 - Downward facing low level discharge 100mm above ground with a wire cage or guard to prevent contact
 - A high level discharge into a metal hopper and metal down pipe.
 - **All the above G3 3.62**

- 12) To prevent scalding the hot supply to a bath should be limited by a blending valve to a maximum temperature of:
- 44 degrees
 - 43 degrees
 - **48 degrees G3 3.65**
 - 60 degrees
- 13) When commission is carried out by a person registered with a competent person scheme he must give notice to the Building Control Bodies (BCB) within
- 7 days
 - 10 days
 - **30 days G3 3.78**
 - 3 months
- 14) What is the recommended cold water pipe size for an unvented cylinder?
- **22mm**
 - 35mm
 - 15mm
 - 28mm
- 15) What is the recommended minimum flow rate required for an unvented cylinder?
- 10 litres per minute
 - 15 litres per minute
 - **20 litres per minute**
 - 25 litres per minute
- 16) What is the resistance created by a 22mm elbow on a discharge pipe D2 in metres?
- 0.5m
 - **0.8m G3 Table 1**
 - 1m
 - 1.5m
- 17) Water discharges continually from the expansion relief valve every time the cylinder is heated, what could be the possible cause?

- Faulty expansion relief valve
- Faulty temperature relief valve
- Faulty pressure reducing valve
- **Faulty Expansion vessel**