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8202-525 MARCH 2018

Level 2 Technical Certificate in Plumbing

Level 2 Plumbing – Theory exam

Thursday 22 March 2018

09:30 – 11:30

You should have the

following for this examination

- a multiple-choice answer sheet
- a pen with black or blue ink
- non-programmable calculator

This question paper is the property of City & Guilds Limited and is to be returned after the examination.

Read the following notes before you answer any questions

- You **must** use a pen with black or blue ink to complete **all** parts of the answer sheet.
- Check that you have the correct answer sheet for the examination.
- Check that your name and candidate details are printed correctly at the top of your answer sheet.
- Inform the invigilator if your name or examination details are not correct.
- Each question shows **four** possible answers (lettered 'a', 'b', 'c' and 'd'); only **one** is correct.
- Decide which **one** is correct and mark your answer on the **answer sheet** with your pen.

For example if you decide 'a' is correct, mark your answer like this

101	<input checked="" type="radio"/>	(b)	(c)	(d)
	Cancel	Cancel	Cancel	Cancel

If you want to change your answer, cancel your first choice by filling in the 'cancel' box below the circle like this

101	<input checked="" type="radio"/>	(b)	(c)	(d)
	Cancel	Cancel	Cancel	Cancel

Then mark the answer which you have now decided is correct. For example if you now decide 'c' is correct, mark your answer like this

101	<input checked="" type="radio"/>	(b)	<input checked="" type="radio"/>	(d)
	Cancel	Cancel	Cancel	Cancel

Any other marks on the form may invalidate some of your answers.

- Any calculations or rough working can be done on the question paper.
- Attempt all questions. If you find a question difficult, leave it and return to it later.

This paper contains 60 questions. Answer them using the 'boxes' numbered 1 to 60 on the answer sheet.

- 1 Who is responsible for investigating accidents on site?
 - a Employer.
 - b Health and Safety Executive.
 - c Health and Safety commission.
 - d Local authority.
- 2 How can segregation of a working area from the general public be achieved?
 - a Barriers and signs.
 - b Toe boards.
 - c Wearing PPE.
 - d Kick boards and handrails.
- 3 Who is responsible for providing adequate PPE on site?
 - a Employer.
 - b Site foreman.
 - c Main contractor.
 - d Client.
- 4 When would wooden access equipment be permitted for use?
 - a When they are over 5 m long.
 - b When they have not been painted.
 - c When they have not been exposed to the rain.
 - d When they have been erected to 45 degree angle.
- 5 What is required from employers' to comply with RIDDOR?
 - a To keep a daily accident log.
 - b To report every incident in the workplace.
 - c To report incidents of injuries below seven days absence.
 - d To report incidents of injuries above seven days absence.
- 6 What action **must** be taken when flux comes into contact with the skin?
 - a Apply barrier cream.
 - b Wipe off with a cloth.
 - c Rinse with clean water.
 - d Clean skin with spirit based solvents.
- 7 What document states the correct installation and operation of a new plumbing component?
 - a Manufacturer's brochure.
 - b Merchants catalogue.
 - c Manufacturer's instructions.
 - d Manufacturer's warranty.
- 8 Under safe isolation, what additional controls are in place once the breaker has been locked off correctly?
 - a Warning tag to identify that the circuit is currently being worked on.
 - b Customer should be informed on how to reinstate the supply.
 - c Live supplies notice should be displayed at the point of work.
 - d Lock off key attached to the point of isolation clearly identifying how to reinstate supplies.
- 9 Cold water storage cisterns fitted into roof spaces must be installed correctly with provision for routine maintenance. How should the cistern be installed?
 - a On a fully supported uninsulated base to prevent condensation.
 - b Without base support to allow access for service.
 - c Directly on joists and fully insulated to prevent condensation.
 - d Completely insulated to prevent warming.
- 10 What size over current protection device will be needed to protect a circuit that has a 4 kW electric water heater installed on a 230 volt supply?
 - a 5 amps.
 - b 10 amps.
 - c 13 amp.
 - d 16 amps.
- 11 Why are brass screws used to secure sanitary appliances?
 - a Malleability.
 - b Corrosion resistance.
 - c Visual appearance.
 - d Compressive strength.

- 12 What material is suitable for connecting a pipe to a polythene cold water storage cistern?
- Metal washer.
 - Lead washer.
 - Jointing compound.
 - Plastic washer.



Figure 1

- 13 What is the purpose of the item shown in Figure 1?
- To secure a brick faced surface.
 - To secure a solid concrete surface.
 - To secure a wooden surface.
 - To secure a plasterboard studded wall surface.
- 14 Why are Float Operated Valves fitted to toilet cisterns constructed from plastic and brass?
- Low water contents.
 - Low cost installation.
 - High compressive strength.
 - High corrosion resistance.
- 15 What term is used for the increasing length that a material expands by per °C rise in temperature?
- Temperature expansion.
 - Linear stretch.
 - Coefficient of linear expansion.
 - Coefficient of stretch.
- 16 What affect does a machine bend have on pipework?
- Make it easier to apply pipe insulation.
 - Make it easier to solder pipework.
 - Increase frictional resistance.
 - Reduce frictional resistance.

- 17 What document provides guidance on the correct methods of setting limiting temperatures to blended water?
- Document C Building Regulations.
 - Document G Building Regulations.
 - Document H Building Regulations.
 - Document J Building Regulations.
- 18 What alloy is made from combining Copper and Zinc?
- Bronze.
 - Brass.
 - Steel.
 - Aluminium.
- 19 A customer has moved into a new build property. During a summer shower the guttering joint has started to leak. What is the **most** likely reason?
- No allowance for linear expansion.
 - Clipping is less than 500 mm apart.
 - Excessive fall.
 - Insufficient fall.
- 20 A plumber is asked to install a 15 mm external bib tap to a house extension and needs to provide a suitable pipe access route. What would be the **most** appropriate method to route the pipework?
- Drill a 15 mm hole from the outside in.
 - Drill a 15 mm hole from the inside out.
 - Drill a pilot hole from the inside out and then drill from the outside in.
 - Carefully remove a brick to pass pipework through then make a good repair with cement.
- 21 What is used for solvent cement jointing techniques?
- PVC
 - MDPE
 - MPPE
 - MPVA
- 22 At what temperature is water at it's **most** dense?
- 4 °C
 - 10 °C
 - 0 °C
 - 100 °C

23 What current effects gravity circulation of warm air?

- a Conduction.
- b Convection.
- c Radiation.
- d Rectification.

24 What electrical device has an integral test feature?

- a Cartridge fuse.
- b MCB.
- c RCD.
- d Re-wiring fuse.

25 What is the **minimum** size of earth bonding?

- a 6 mm
- b 8 mm
- c 10 mm
- d 12 mm

26 What are the two common types of electrical circuits?

- a Series and parallel.
- b Parallel and sequence.
- c Sequence and series.
- d Combined and separate.

27 When does precipitation occur?

- a When water vapour in the atmosphere evaporates and falls as rain.
- b When water vapour in the atmosphere condenses and falls as rain.
- c When water vapour in the atmosphere recycles and falls as rain.
- d When water vapour in the atmosphere dissolves and falls as rain.

28 What colour is Underground MDPE for cold water distribution?

- a Red.
- b Blue.
- c Grey.
- d Yellow.

29 A plumber is working on an installation of plastic pressure pipe on an extension to a property. The installation requires the addition of new pipework to the existing cold water supply and has been tasked to ensure the installation is tested as appropriate.

What is the **most** appropriate statement below regarding testing the system?

- a 10 bar for 2 hours then 2 bar for 10 minutes.
- b 2 bar for 10 minutes then 10 bar for 10 minutes.
- c By using the existing cold main supply pressure only.
- d There is no requirement to test plastic pipe on extensions.

30 The employer has instructed for routine planned maintenance in a hospital to be carried out.

Which statement is correct with reference to a bath or shower?

- a It is essential to allow the customer to have full control of the temperature of the bathing temperatures.
- b Due to legislation and to prevent scalding, water has a limit temperature of 43 °C.
- c Due to legislation and to prevent scalding, water has a limit temperature of 38 °C.
- d It is essential to limit temperatures to conserve energy.

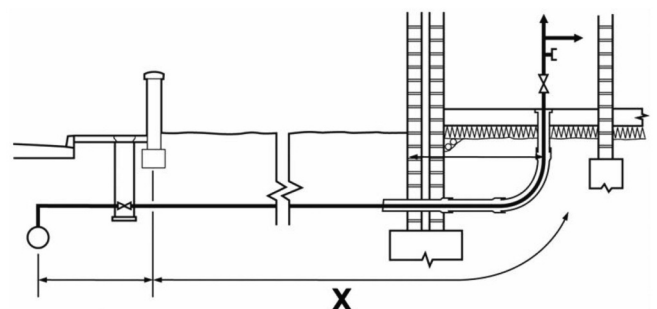


Figure 2

31 What pipework section is marked 'X' in Figure 2 of an incoming cold water supply pipework to a property?

- a Communication pipe.
- b Distributing pipe.
- c Service pipe.
- d Guard pipe.

- 32 What are the **main** considerations when assessing the suitability of a distributed cold water supply?
- The chlorine level and flow rate.
 - The calcium level and hardness.
 - The pressure and acidity level.
 - The pressure and flow rate.
- 33 What backflow prevention method is used to protect an external hose union bib tap?
- Single check valve.
 - AUK1.
 - Double check valve.
 - AUK2.

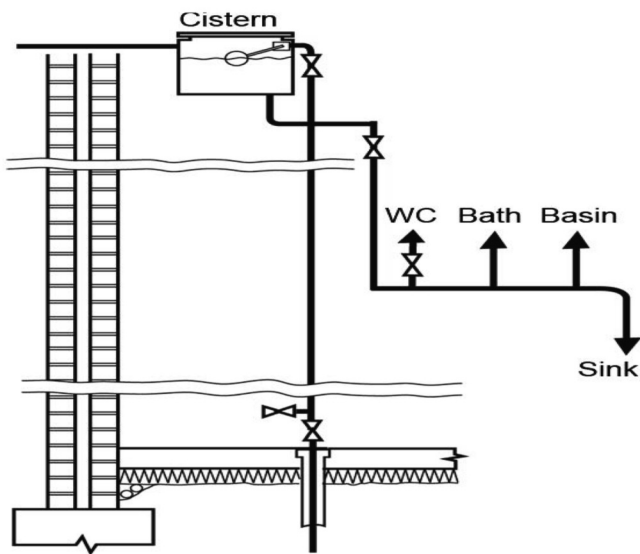


Figure 3

- 34 What principle complies with the system shown in Figure 3?
- Gravity pressure.
 - Pumped pressure.
 - Rain-water harvested.
 - Directly fed from the mains.
- 35 To ensure adequate hot water supplies are achieved on an indirect system, what should be the **minimum** pipe size supplying a bath outlet.
- 10 mm
 - 15 mm
 - 22 mm
 - 28 mm

- 36 What has the **most** influence on the selection of hot water system?
- Cost, location, height of building.
 - Occupancy, type of building, available services.
 - Materials building made from, local labour, floor plan.
 - Owner preference, mains pressure, installation time.
- 37 What term correctly describes how water flows from a single point water heater?
- Replacement.
 - Displacement.
 - Stratification.
 - Hydrostatic.
- 38 What document is the **most** suitable for guidance on hot water systems efficiency?
- Building Regulations A.
 - Building Regulations B.
 - Building Regulations H.
 - Building Regulations L.
- 39 On commissioning a new heating system ready for customer handover in a new build property. The plumber has found that all the radiators and hot water circuits operate correctly except the radiator in the en-suite.

What is the **most** likely cause?

- Failed heating pump.
 - TRV head not fitted.
 - Pipework is too small.
 - Lock shield valve not open.
- 40 The routine replacement of a motorised valve on a heating system in an occupied property has been completed by the supervisor and has tasked the plumber to complete the final actions.
- What is the final action required of any maintenance procedure?
- Final isolation of the supply to test for safety.
 - Opening all the outlets to check correct flow rates.
 - Disinfect system and drain down before handing over to customer.
 - Turn on supplies and test for correct operation before handing over to customer.

41 What installation provides hot water to the whole dwelling?

- a Localised.
- b Optimised.
- c Centralised.
- d Point of use.

42 What is the **most** appropriate sequence to follow when replacing a hot water cylinder?

- a Isolate water, replace cylinder, notify customer, commission.
- b Notify customer, isolate water, replace cylinder, commission.
- c Isolate water, notify customer, replace cylinder, check flow rates.
- d Notify customer, isolate water, replace cylinder, check flow rates.

43 What action **must** be taken when permanently decommissioning a hot water installation?

- a All dead legs must be removed.
- b All pipework must be treated with chlorine.
- c All outlets must be capped at the appliances.
- d All pipework must be left in place in case of reconnection.

44 Which legislation describes the requirement to have separately zoned space heating areas in dwellings?

- a Building Regulations Part L.
- b Building Regulations Part P.
- c Water Regulations Guide.
- d Manufacturer's catalogue.

45 What operating principle prevents the boiler from firing unless there is demand from either space heating or hot water thermostat?

- a Boiler cyclone.
- b Boiler antilock.
- c Boiler interlock.
- d Boiler anti-cycle.

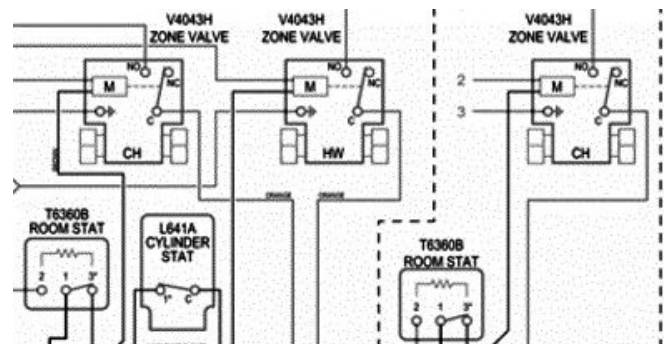


Figure 4

46 What heating system is indicated by the wiring diagram shown in Figure 4?

- a S Plan plus.
- b Y Plan.
- c S Plan.
- d W plan.

47 The feed and expansion arrangement allows for the expansion of water in the heating circuit on an open vented heating installation. How is the expansion of water accommodated in a sealed system?

- a Auto air vent.
- b Manual air vent.
- c Expansion vessel.
- d Composite valve.

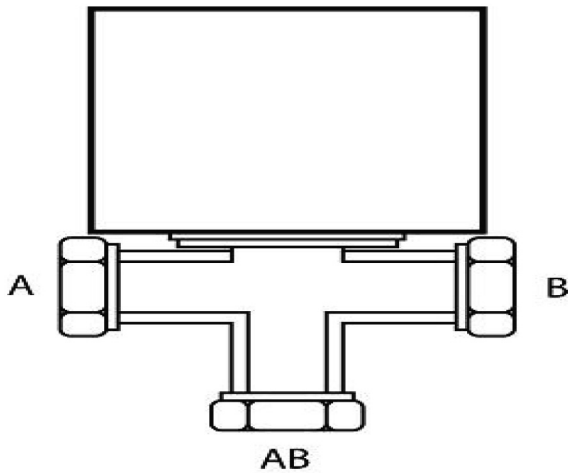


Figure 5

- 51 What is a **main** design consideration when calculating the size of heat emitters in relation to a room?
- a Pipework material.
 - b Emitter location.
 - c Valve type.
 - d Heat loss.

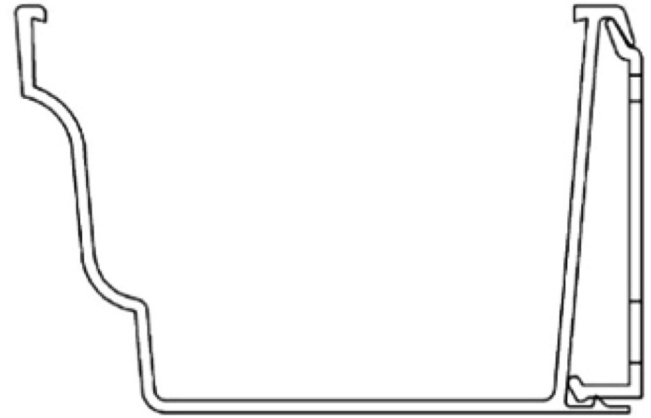


Figure 6

- 48 When decommissioning a 3 port valve, what pipework connects to port AB shown in Figure 5?
- a Boiler flow.
 - b Boiler return.
 - c Expansion vessel.
 - d Temperature relief valve.
- 49 A new housing development has specified that solvent weld pipe must be used for the installation of sanitary wear. What is the **most** important consideration?
- a A well ventilated area.
 - b Barriers assembled around the work area.
 - c Ensure additional lighting before starting work.
 - d Gaining a hot works permit before starting work.
- 50 Water is discoloured from the hot outlet on an indirect system. The water level in the feed and expansion cistern has risen. What is the **most** likely cause?
- a Split in the coil within the cylinder.
 - b Water supplied from a protected cistern.
 - c Sacrificial anode has corroded.
 - d Overheated immersion within the cylinder.

- 52 What type of guttering is shown in Figure 6?

- a Half Round.
- b Deep Well.
- c Square line.
- d Ogee.

- 53 What can be determined using factors 1, 2, 3 and 4?

- 1 Rainfall intensity
- 2 Size of roof
- 3 Running outlets
- 4 Gutter fall

- a Type of material to be used.
- b How to connect the rainwater to the drain.
- c The shape of the guttering system.
- d Type and size of guttering system.

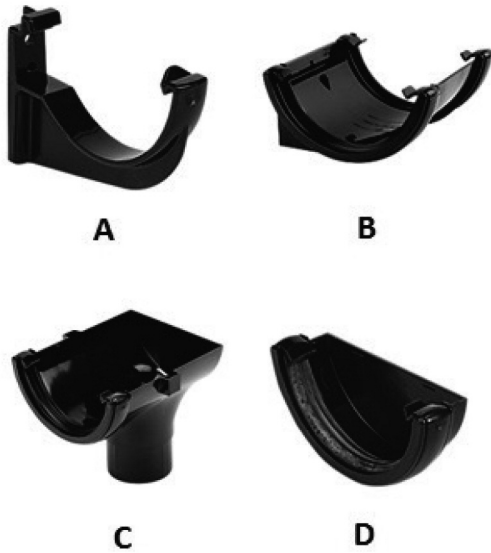


Figure 7

54 Determine the correct order that components 1, 2, 3 and 4 are laid out in Figure 7?

- 1 A union
- 2 A stop end
- 3 A bracket
- 4 Stop end outlet

- a B, D, A, C
- b B, C, A, D
- c D, C, B, A
- d A, B, C, D

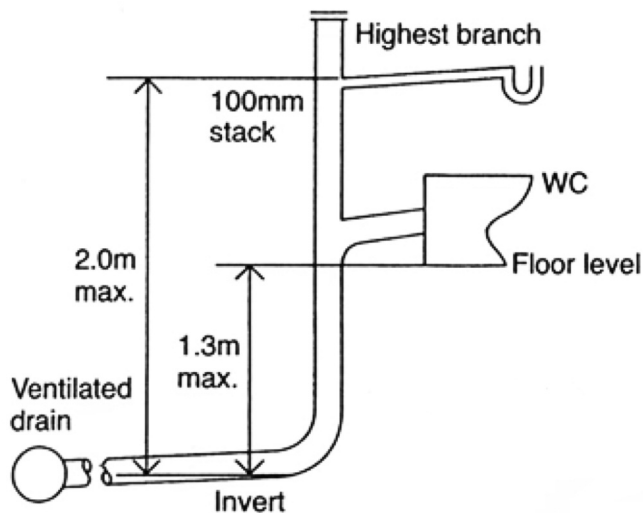


Figure 8

55 What type of system is shown in Figure 8?

- a Vented stack.
- b Unvented stack.
- c Branched stack.
- d Stub stack.



Figure 9

56 Identify the component shown in Figure 9?

- a Bottle Trap.
- b Anti-vacuum bottle trap.
- c Anti-vacuum running trap.
- d Waterless trap.

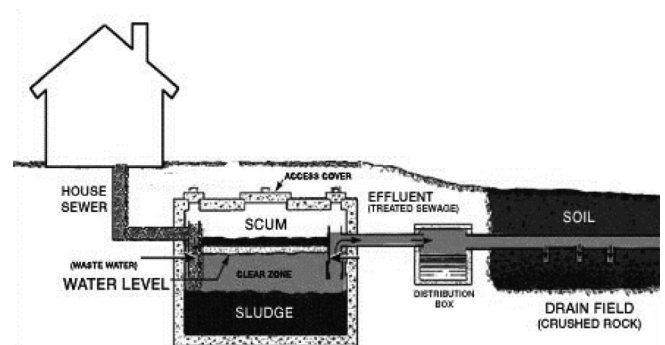


Figure 10

57 What type of drainage system is shown in Figure 10?

- a Septic tank installation.
- b Combined system.
- c Reed bed system.
- d Conventional system.

58 How should condense drains from boilers be discharged to limit exposure to freezing temperatures?

- a Externally 100 mm above the floor to prevent scalding.
- b Externally turned back to the wall.
- c Internally to a suitable foul water discharge point.
- d Internally to an existing overflow outlet.

- 59 A customer has complained of poor outlet pressure through a thermostatic shower. How can this issue be resolved?
- a Install a single impeller pump to boost the cold water supply.
 - b Install a single impeller pump to boost the hot water supply.
 - c Install a twin impeller pump to boost the hot and cold water supply.
 - d Install a sump pump to boost the hot and cold water supply.

- 60 What is the correct procedure to follow when carrying out commissioning of a cold water system?
- a Visual inspection, flushing, disinfecting, soundness testing, performance testing, final checks and handover.
 - b Visual inspection, soundness testing, disinfecting, flushing, performance testing, final checks and handover.
 - c Soundness testing, visual inspection, performance testing, flushing, disinfecting, final checks and handover.
 - d Flushing, disinfecting, visual inspection, soundness testing, performance testing, final checks and handover.

NOW GO BACK AND CHECK YOUR WORK

- **IMPORTANT -**
Are the details at the top of the answer sheet correct?
Have you filled in your answers in INK in the appropriate boxes on the answer sheet?