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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

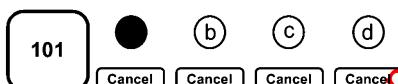
- a multiple-choice answer sheet
- a pen with black or blue ink
- non-programmable calculator

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

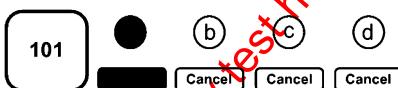
Read the following notes before you answer any questions

- 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.

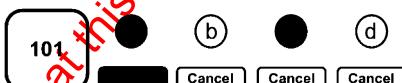
For example if you decide 'a' is correct, mark your answer like this



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



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



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?

- a Metal washer.
- b Lead washer.
- c Jointing compound.
- d Plastic washer.



Figure 1

13 What is the purpose of the item shown in Figure 1?

- a To secure a brick faced surface.
- b To secure a solid concrete surface.
- c To secure a wooden surface.
- d To secure a plasterboard studded wall surface.

14 Why are Float Operated Valves fitted to toilet cisterns constructed from plastic and brass?

- a Low water contents.
- b Low cost installation.
- c High compressive strength.
- d High corrosion resistance.

15 What term is used for the increasing length that a material expands by per °C rise in temperature?

- a Temperature expansion.
- b Linear stretch.
- c Coefficient of linear expansion.
- d Coefficient of stretch.

16 What affect does a machine bend have on pipework?

- a Make it easier to apply pipe insulation.
- b Make it easier to solder pipework.
- c Increase frictional resistance.
- d Reduce frictional resistance.

17 What document provides guidance on the correct methods of setting limiting temperatures to blended water?

- a Document C Building Regulations.
- b Document G Building Regulations.
- c Document H Building Regulations.
- d Document J Building Regulations.

18 What alloy is made from combining Copper and Zinc?

- a Bronze.
- b Brass.
- c Steel.
- d 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?

- a No allowance for linear expansion.
- b Clipping is less than 500 mm apart.
- c Excessive fall.
- d 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?

- a Drill a 15 mm hole from the outside in.
- b Drill a 15 mm hole from the inside out.
- c Drill a pilot hole from the inside out and then drill from the outside in.
- d Carefully remove a brick to pass pipework through then make a good repair with cement.

21 What is used for solvent cement jointing techniques?

- a PVC
- b MDPE
- c MPPE
- d MPVA

22 At what temperature is water at it's **most** dense?

- a 4 °C
- b 10 °C
- c 0 °C
- d 100 °C

23 What current effects gravity circulation of warm air?

- Conduction.
- Convection.
- Radiation.
- Rectification.

24 What electrical device has an integral test feature?

- Cartridge fuse.
- MCB.
- RCD.
- Re-wiring fuse.

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

- 6 mm
- 8 mm
- 10 mm
- 12 mm

26 What are the two common types of electrical circuits?

- Series and parallel.
- Parallel and sequence.
- Sequence and series.
- Combined and separate.

27 When does precipitation occur?

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

28 What colour is Underground MDPE for cold water distribution?

- Red.
- Blue.
- Grey.
- 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?

- 10 bar for 2 hours then 2 bar for 10 minutes.
- 2 bar for 10 minutes then 10 bar for 10 minutes.
- By using the existing cold main supply pressure only.
- 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?

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

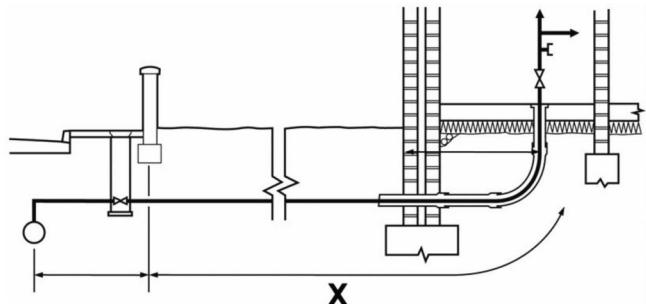


Figure 2

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

- Communication pipe.
- Distributing pipe.
- Service pipe.
- Guard pipe.

32 What are the **main** considerations when assessing the suitability of a distributed cold water supply?

- a The chlorine level and flow rate.
- b The calcium level and hardness.
- c The pressure and acidity level.
- d The pressure and flow rate.

33 What backflow prevention method is used to protect an external hose union bib tap?

- a Single check valve.
- b AUK1.
- c Double check valve.
- d AUK2.

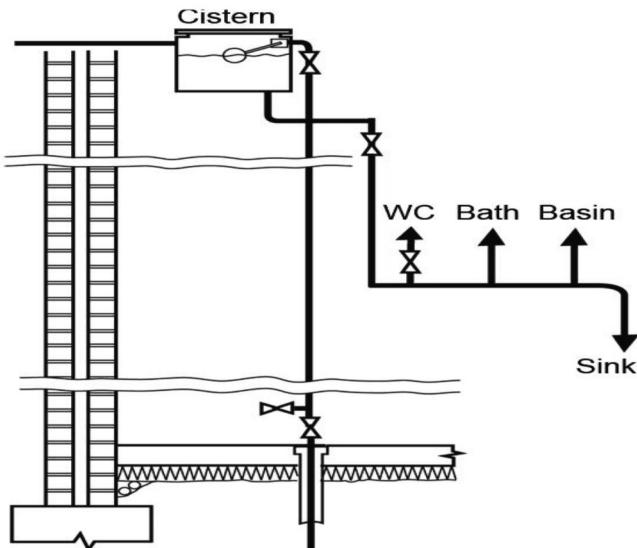


Figure 3

34 What principle complies with the system shown in Figure 3?

- a Gravity pressure.
- b Pumped pressure.
- c Rain-water harvested.
- d 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?

- a 10 mm
- b 15 mm
- c 22 mm
- d 28 mm

36 What has the **most** influence on the selection of hot water system?

- a Cost, location, height of building.
- b Occupancy, type of building, available services.
- c Materials building made from, local labour, floor plan.
- d Owner preference, mains pressure, installation time.

37 What term correctly describes how water flows from a single point water heater?

- a Replacement.
- b Displacement.
- c Stratification.
- d Hydrostatic.

38 What document is the **most** suitable for guidance on hot water systems efficiency?

- a Building Regulations A.
- b Building Regulations B.
- c Building Regulations H.
- d 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?

- a Failed heating pump.
- b TRV head not fitted.
- c Pipework is too small.
- d 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?

- a Final isolation of the supply to test for safety.
- b Opening all the outlets to check correct flow rates.
- c Disinfect system and drain down before handing over to customer.
- d 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.

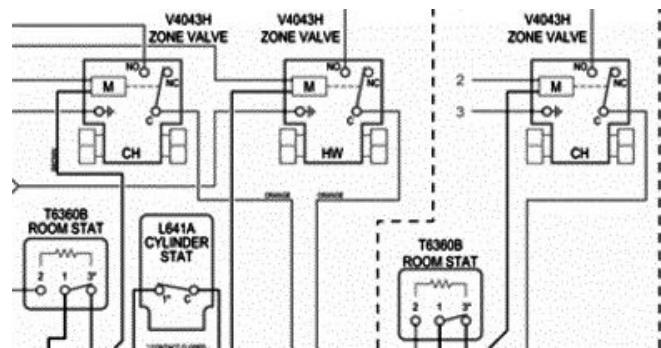


Figure 4

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.

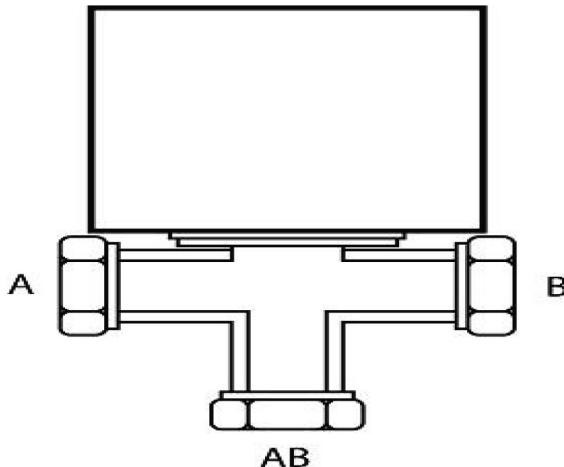


Figure 5

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.

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

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

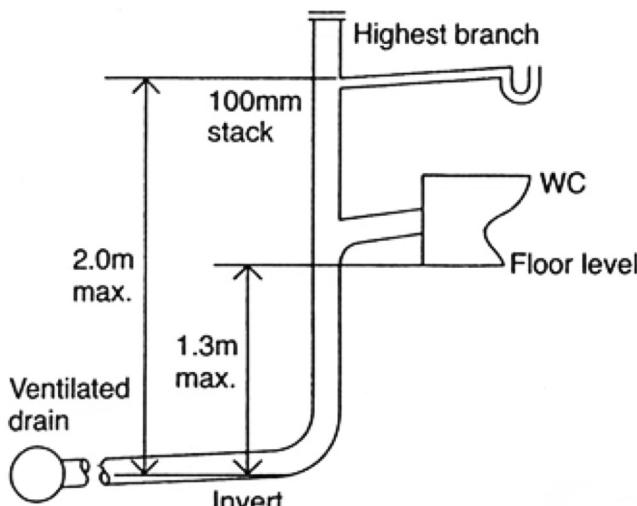


Figure 8

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.

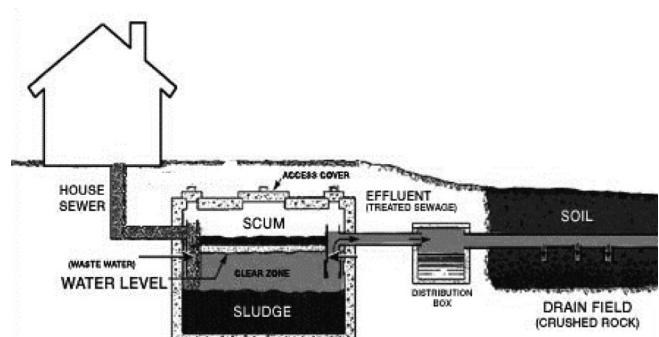


Figure 10

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 condensate 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?