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8202-525 MARCH 2022
Level 2 Technical Certificate in Plumbing
Level 2 Plumbing – Theory Exam

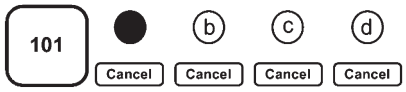
Tuesday 29 March 2022
09:30 – 11:30

You should have the following for this examination
- a multiple-choice answer sheet
- a pen with black or blue ink

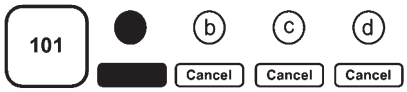
This question paper is the property of the City and Guilds of London Institute and is to be returned after the examination.

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.

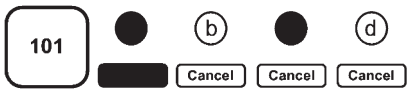
For example if you decide 'a' is correct, mark your answer like this



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.

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1 Who would issue an improvement notice?

a Health and safety inspector.
b Building control officer.
c The water inspector.
d The contract manager.

2 Fibreglass loft insulation is a hazardous substance and can be classed as:

a Irritant.
b Toxic.
c Corrosive.
d Harmful.

3 What is the first course of action when dealing with a minor burn?

a Move the person outside so they can breathe fresh air.
b Apply antiseptic cream to the burn area.
c Cool the burn area with cold running water.
d Apply butterfly bandages to the burn area.

4 How often should electrical power tools be PAT tested on buildings sites?

a Every 3 months.
b Every 6 months.
c Every time before using them.
d Every time after using them.

5 A propane gas cylinder is identified by which colour?

a Blue.
b Red.
c Yellow.
d Black.

6 Toe boards must be fitted to mobile tower scaffolds when the working platform exceeds a height of:

a 1 m
b 1.5 m
c 1.75 m
d 2 m.

7 Why are LPG gas cylinders stored outside in a lockable cage?

a To allow the gas to settle to the bottom of the cylinder.
b To allow the gas to circulate within the cylinder using convection currents.
c If there is a leak the gas is diluted into the atmosphere preventing unsafe situations.
d The cage will keep the cylinder at a constant temperature stopping the contents from freezing.

8 What is the first action to take before working in a confined space, as recommended by the Management of Health and Safety at Work Regulations?

a Obtain a permit to work.
b Carry out a risk assessment of all work.
c Take air samples to identify a build-up of fumes.
d Issue an improvement notice to limit exposure to unsafe situations.

https://www.toolstation.com

Figure 1

9 Identify the hand tool shown in Figure 1.

a Pipe slice.
b Adjustable pipe cutter.
c Hole saw.
d Pipe threader.

https://www.tubela.com

Figure 2

10 Identify the tool shown in Figure 2.

a Hydraulic bending machine.
b Hydraulic crimping machine.
c Hand held LCS threading machine.
d Electric LCS threading machine.

11 A joist has a depth of 200 mm.
What is the **maximum** depth a notch in the joist can be made?

a 14 mm.
b 25 mm.
c 50 mm.
d 80 mm.

12 What type of fixing is used to secure a WC pan into position?

a A countersunk brass screw.
b A collapsing cavity fixing.
c A countersunk steel screw.
d A coach bolt fixing.

13 Identify the correct statement when sleeving cold water copper pipework passing through an external masonry wall.

a The sleeve should be the same size as the copper pipework to allow for pipe expansion.
b The sleeve should be made from low carbon steel to prevent galvanic corrosion.
c The sleeve should be sealed at one end to prevent the build-up of explosive gases.
d The sleeve should be sealed at both ends to stop vermin entering the property.

14 State the material 15 mm plastic pressure pipe is made from.

a Polybutylene.
b Medium density polyethylene.
c Polypropylene.
d Poly vinyl chloride.

15 The Principal property of copper can be described as:

a Tensile strength.
b Ductility.
c Shear strength.
d Hardness.

16 What is the SI derived unit for density?

a m/s^2
b kg
c kg/m^3
d J

17 Sensible heat is **best** described as:

a heat that causes a change in water temperature but not a change in state.
b heat that causes a change in water temperature and a change in state.
c the volume of a quantity of gas, held at a constant temperature, can vary directly with the surrounding heat.
d the volume of gas at a stable surrounding heat can vary with the pressure being applied.

18 At what temperature is water at its most dense?

a 0°c
b 4°c
c 10°c
d 100°c.

19 A fulcrum is a component used in which mechanical principle?

a Levers.
b Pulleys.
c Equilibrium.
d Axles.

20 What colour is the earth insulation on temporary continuity bonding?

a Brown/blue.
b Brown.
c Blue.
d Yellow/green.

See next page

21 Identify the unit in which electrical resistance is measured.

a Ohms.
b Amperes.
c Coulombs.
d Volts.

22 A boiler has been fitted with a 13 amp fuse. The boiler is rated at 690 watt and is installed on a 230 volt supply.

What action should be taken?

a Leave it as it is.
b Change the fuse for a 16 amp fuse.
c Change the fuse for a 3 amp fuse.
d Install a 16 amp RCD to at the fuse spur.

https://www.dhsspares.co.uk

Figure 3

23 What is the purpose of the item shown in Figure 3?

a Checking outlet pressure.
b Checking flow rates.
c Checking water quality.
d Checking water temperature.

24 Precipitation is **best** described as:

a water vapour condensing in the air and falling back to earth
b water that is heated and rises into the atmosphere as a vapour
c liquid water that is cooled causing a change in state to a solid
d solid water that is heated causing a change in state to a liquid.

25 Which backflow method provides protection from a garden hose when connected to an outside tap?

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

26 Waste water from baths and showers that is collected and reused to flush WCs is called:

a potable water
b black water
c rain water harvesting
d grey water recyling.

27 What component is used to connect the communication pipe to the water undertaker's main?

a A ferrule.
b A stop tap.
c An end feed coupler.
d A type A compression coupler.

28 What cold water system would be appropriate for a property in an area with low water pressure?

a A direct system.
b An indirect system.
c An unvented system.
d A combination boiler.

29 What is the cause of water dripping from the cold water storage cistern overflow pipe?

a An incorrectly adjusted float operated valve.
b Stagnation of stored cold water.
c The float arm is pushing the plunger back onto the diaphragm washer and valve orifice.
d No bye-law 30 kit is installed on the cistern causing the contents to expand in hot conditions.

30 What is a basic factor that needs to be considered when selecting a hot water system?

a The building orientation.
b The building occupancy.
c Above ground drainage outlets.
d Heat gains from adjacent properties.

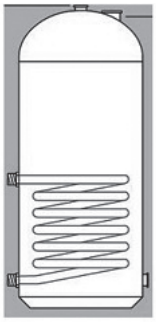

Figure 4

31 What type of cylinder is shown in Figure 4?

a Double feed indirect.
b Single feed indirect.
c Direct.
d Thermal store.

32 Why should a Thermostatic Mixing Valve be installed on the hot supply to a bath?

a To stop backflow at the bath taps.
b To limit exposure to high water temperatures.
c To keep the water temperature above 65°C to kill bacteria.
d To balance the pressure at the hot and cold supplies to the bath.

33 What would be the outcome if a cylinder immersion heater thermostat failed in the on position?

a The high-limit thermostat would activate and switch off the power stopping the contents from boiling.
b The cylinder contents would boil and cause an unsafe situation with high temperature water.
c The cylinder insulation would keep the contents cool until the fault can be repaired.
d The safety open vent would allow air into the system keeping the contents of the cylinder from boiling.

34 What should happen to the cold supply when permanently decommissioning an electric shower when upgrading a bathroom within an occupied property?

a It should be isolated with a single check valve to limit backflow occurrences.
b It should be isolated as short as possible removing the dead leg to prevent possible bacterial growth.
c It should be isolated at the main stop valve within the property to prevent any leaks developing.
d It should be isolated with a ball-o-fix isolation valve for a simple connection of the cold water supply for future extensions.

Figure 5

35 What hot water system is shown in Figure 5?

a Localised.
b Centralised.
c A thermal store.
d Immersion heater.

See next page

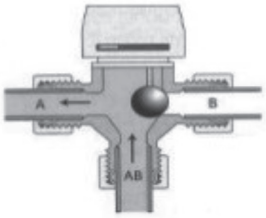

Figure 6

36 How will a central heating system work with the 3 port valve in the current position as shown in Figure 6?

a The system will supply heating.
b The system will supply hot water.
c The system will supply flow through the bypass circuit.
d The system will supply both hot water and central heating.

37 Where is the neutral point on an open vented S plan central heating system?

a Where the middle radiator is installed.
b Where the automatic air vent is installed.
c Where the cold feed connects to the system.
d Where the automatic bypass is connected in the system.

www.screwfix.com

Figure 7

38 Identify the type of heat emitter shown in Figure 7.

a Towel rail.
b Single panel radiator.
c Double panel radiator.
d Low surface temperature radiator.

39 Why is an automatic air vent installed on a central heating system?

a It is installed to allow air out of the system.
b It is installed to allow air into the system.
c It is installed to keep the central heating system operating under negative pressure.
d It is installed to keep the central heating system operating at neutral pressure.

40 What component gives the customer independent control of both the central heating and hot water systems?

a Programmer.
b Room Thermostat.
c Pump.
d Thermostatic radiator valve.

41 Central heating systems and components must be maintained in accordance with which document?

a The Water Supply Water Fittings regulations 1999.
b Manufacturer's instruction.
c Building Regulations Part G.
d British Standards.

42 Identify the correct sequence to be followed when installing a guttering system.

1 Fix the last bracket to give the amount of fall required.
2 Attach a string line between the two brackets.
3 Position the rest of the brackets at recommended centres.
4 Establish the installation fall.
5 Fix the first bracket at the highest level on the run.

a 1,5,4,2,3.
b 5,4,1,3,2.
c 5,4,1,2,3.
d 4,5,3,2,1.

43 What material is commonly used in the manufacture of a guttering system installed in domestic dwellings?

a ABS.
b LCS.
c PVCu.
d MDPE.

www.screwfix.com

Figure 8

44 Identify the type of guttering shown in Figure 8.

a Square section.
b Half round.
c High capacity.
d Ogee.

45 A ventilated stack is installed within 3 m of an openable window.

What is the **minimum** distance above the window the stack should terminate?

a 700 mm
b 800 mm
c 900 mm
d 1000 mm.

46 What is the working principle of a hydraulic flush control to a cistern described as?

a A sudden reduction in pressure allowing a certain amount of water through to the cistern, resulting in less frequent flushing.
b A constant flow of water through to the cistern, resulting in more frequent flushing.
c A dual flush valve positioned on top of the cistern, it's operated manually allowing either a 4 or 6 litre flush.
d A manual flushing handle positioned on the side of the cistern, when operated it creates a siphonic action clearing the cistern contents.

47 A wash hand basin has been installed on a branch connection of 2 m.

What fault will occur on the branch connection?

a Waving out.
b Self Siphonage.
c Induced Siphonage.
d Compression.

48 What is the name of the horizontal pipe used to discharge water into a slab urinal?

a Sparge pipe.
b Distribution pipe.
c Flush pipe.
d Spray pipe.

49 Traps on a newly installed primary ventilated stack have been losing their seal when the toilet is flushed. The traps are on a separate branch connection.

What is the cause?

a Induced siphonage at the branch connection due to oversized pipework.
b Compression at the foot of the stack due to the installation of a knuckle bend.
c Self siphonage at the appliance trap due to basin not conforming to BS EN 12056.
d Waving out due to wind direction and incorrect cowl type.

50 Traps on a newly installed primary ventilated stack have been losing their seal when the toilet is flushed. The traps are on a separate branch connection.

How can this be fixed?

a Install an automatic air vent on the primary stack.
b Install reducers on the branch connection.
c Install two 45° bends at the foot of the stack.
d Install bottle traps on all basins.

51 You will be working in a loft space. Fibreglass has been used to insulate this exposed area.

What PPE should be used when working in the loft space?

a Goggles, gloves, safety boots and disposable dust mask.
b Goggles, hearing protection, gloves and disposable dust mask.
c Goggles, gauntlets, safety boots and self-contained breathing apparatus.
d Goggles, hearing protection, safety boots and self-contained breathing apparatus.

See next page

52 A customer has complained of lukewarm water coming out of the cold taps during the summer months. You have investigated the plumbing installation and the customer has an indirect cold water system installed in their property.

Why is the cold water heating up?

a There is no bye-law 30 kit installed on the cistern resulting in the contents warming up in the loft space.
b Hot water is being pumped over the feed and expansion cistern due to incorrect pump positioning.
c There is no single check valve installed on the safety open vent resulting in hot water mixing with the cold water in the cistern.
d The hot supply is installed above the cold supply from the cistern resulting in temperature transfer between the supplies.

53 What should be done in order to follow legislation given in part G of the Building Regulations when installing a new bath?

a Install a twin impellor pump to improve flow rates at bath tap outlets for fast filling times.
b Insulate the hot supply to the bath to improve system efficiency.
c Install an anti-vac trap to stop trap seal loss and limit exposure to noxious gases.
d Install a thermostatic mixing valve to limit exposure to high water temperatures.

54 You have been asked to insulate pipework from a hot water storage cylinder on a new build housing site.

What is the **minimum** distance pipework from a cylinder should be insulated to?

a 2 m
b 1.5 m
c 1 m
d 0.5 m

55 You have been called to a property to perform a maintenance activity. Over a period of time the customer has noticed that a radiator has developed some cool spots in the middle and at the bottom.

What is the fault?

a There is build-up of black oxide sludge, this is stopping central heating water accessing all of the radiator internal surface.
b There is build-up of air, this is stopping central heating water accessing all of the radiator internal surface.
c The radiator has been installed with two lockshield valves and this has created a blockage within the radiator and central heating system.
d The radiator is the last one on the circuit and is the last one to heat up as most of the heat has been used heating other rooms in the property.

56 You have been called to a property to perform a maintenance activity. Over a period of time the customer has noticed that a radiator has developed some cool spots in the middle and at the bottom.

How can this be rectified?

a The radiator should be flushed, the system should be refilled with inhibitor and a magnetic filter installed on return pipework close to boiler.
b The radiator should be vented of all air, the system should be refilled with inhibitor and a magnetic filter installed on return pipework close to boiler.
c The system should be drained and the lockshield valves replaced with two thermostatic radiator valves, allowing hot water to pass through the radiator freely.
d The system should be drained and the flow pipework increased in size to allow the water to reach the radiator at a higher temperature.

57 During planned preventative maintenance of a domestic property you have been asked to repair the diaphragm washer on a BS1212 part 2 float operated valve.

What is the **last** step to perform when the maintenance is completed?

a Adjust the water level with the float arm adjustment screw.
b Check the valve orifice for grit and debris.
c Adjust the 'o' ring on the head gear checking for leaks.
d Check that the cold supply back-falls towards the rising main.

58 Which of the following best describes planned preventative maintenance?

a Maintenance to systems and components when a fault suddenly occurs.
b Checks to systems and components at regular intervals to ensure optimum performance.
c Isolation of systems and components while repairs and maintenance are being completed.
d Permanent isolation of systems and components to stop leaks developing within the property.

59 The cast iron guttering at a customer's property has corroded with rust.

How could the life of the guttering have been extended?

a Paint could have been applied forming a barrier between the cast iron and atmosphere.
b A sacrificial anode could have been connected stopping electrolytic corrosion.
c The cast iron should have been dezincifcation resistant and should not have rusted.
d Excess flux should have been removed during the jointing process stopping any corrosion.

60 Which type of deterioration can occur with PVCu guttering?

a Erosion corrosion.
b Type 1 pitting.
c Galvanic corrosion.
d Ultraviolet degradation.

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?