

**Level 2 Technical Certificate in  
Plumbing**

**8202-25**

**Sample Version September 2016**

**Question Paper Pack**

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## 1 Assessment

1. What is the abbreviation for the regulation that ensures that electrical work equipment is suitable, well maintained, and used correctly?
  - a. PUWER.
  - b. POWER.
  - c. POWDER.
  - d. PURGE.
  
2. Which organisation provides information and advice about work-related health, safety and illness?
  - a. Health and Social Executive.
  - b. Health and Safety Executive.
  - c. Health and Safety Expert.
  - d. Health and Social Expert.
  
3. Who is responsible for providing PPE when working on site?
  - a. Employer.
  - b. Main contractor.
  - c. Site foreman.
  - d. Client.
  
4. What is the correct cable colour coding used for 110 V construction site equipment?
  - a. Red.
  - b. Yellow.
  - c. Blue.
  - d. White.
  
5. What is the **maximum** recommended voltage for drills on site when battery powered tools are not available?
  - a. 414 volts.
  - b. 230 volts.
  - c. 315 volts.
  - d. 110 volts.
  
6. When should ladders be considered for use on site?
  - a. Access or light work of short duration and if it is safe.
  - b. Heavy work for long durations and if it is safe.
  - c. If they are long enough to reach the access point.
  - d. If they are erected at an angle 1:6.

7. Trenches should be excavated to what maximum depth before supports are required?
- a. 1.2 m
  - b. 1.6 m
  - c. 2.0 m
  - d. 2.4 m

8. What power tool is shown in the image?



- a. Crimping tool.
  - b. Pipe cutter.
  - c. Reciprocating saw.
  - d. Pipe threader.
9. Which size masonry drill bit would be **most** suitable when fixing a number of 15 mm plastic clips to a brick wall using red plastic plugs?
- a. 6 mm
  - b. 9 mm
  - c. 12 mm
  - d. 15 mm
10. Why would we use a work programme on a plumbing contract?
- a. To monitor the progress of the work.
  - b. To show where the components are to be fitted.
  - c. To list all materials required for the contract.
  - d. To record all money spent on the contract.
11. What copper tube grade would be **most** suitable for installing underground cold water services?
- a. R200 (reinforced).
  - b. R220 (annealed).
  - c. R250 (half hard).
  - d. R290 (hard).

12. What are ripples **most** commonly caused by when bending copper tube on a bending machine?
- Excessive pressure from the roller.
  - Inadequate pressure from the roller.
  - Using new equipment.
  - Using old equipment.
13. What does R1 and R2 equal when R1 is x4 the diameter of a 15 mm tube and the tubes are spaced 80 mm apart?
- R1 = 60 mm, R2 = 140 mm
  - R1 = 60 mm, R2 = 150 mm
  - R1 = 65 mm, R2 = 130 mm
  - R1 = 65 mm, R2 = 160 mm
14. What is the ductility of a metal?
- Its ability to be stretched without breaking.
  - Its hardness to resist scratching.
  - Its ability to transfer heat.
  - Its ability to resist corrosion.
15. What is an example of a thermosetting plastic?
- Polyester.
  - ABS.
  - Polypropylene.
  - Polyethylene.
16. Which pair of metals will be effected by electrolytic corrosion the **most** when in the presence of moisture?
- Tin and lead.
  - Iron and zinc.
  - Copper and iron.
  - Copper and aluminium.
17. What type of material allows the free movement of electrons?
- Good conductor.
  - Good insulator.
  - Good resistor.
  - Good transformer.

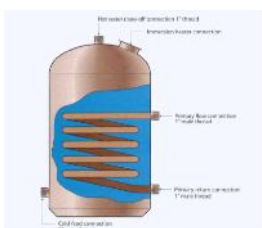
18. What size over current protection device is **most** suitable to protect a circuit that has a 9kW electric shower installed on a 230volt supply?
- a. 16 amps.
  - b. 32 amps.
  - c. 40 amps.
  - d. 50 amps.
19. What water source is **best** for providing water of a good quality?
- a. Deep well.
  - b. Shallow well.
  - c. River.
  - d. Canal.
20. What pipe brings water from the water main at the property boundary up to the stop tap in the property?
- a. Supply pipe.
  - b. Communication pipe.
  - c. Service pipe.
  - d. Distribution pipe.
21. Which cold water system has the following advantages?
- Reserve water supply  
Reduced risk of water hammer  
Less risk of back flow  
Showers may be supplied at equal pressure
- a. Indirect system.
  - b. Direct system.
  - c. High pressure system.
  - d. Gravity system.
22. What sequence of treatment does water go through before it is classed as wholesome?
- a. Sedimentation, filtration, sterilisation.
  - b. Filtration, sterilisation, sedimentation.
  - c. Sterilisation, sedimentation, filtration.
  - d. Sedimentation, sterilisation, filtration.

23. Which document contains information about the correct accommodation of pipes in walls and is classed as a statutory document?
- Manufacturer's instructions.
  - BS EN 806.
  - BS 6700.
  - The Water supply Regulations 1999.

24. What type of FOV is shown in the image?



- BS 1212 Part 1
  - BS 1212 Part 2
  - BS 1212 Part 3
  - BS 1212 part 4
25. What type of hot water cylinder is shown in the image?



- An indirect single feed cylinder.
  - A direct double feed cylinder.
  - A direct twin coil cylinder.
  - An indirect single coil cylinder.
26. What are the **most** important factors to be considered when selecting a type of hot water installation?
- Occupancy, distance to outlets, mains pressure available.
  - Building materials, floor height, size of pipework.
  - Local labour availability, floor plan of building, occupancy.
  - Owner preference, floor height, weight of cistern.



27. To create a reasonable shower pressure the **minimum** distance from the bottom of the supply cistern to the shower head would be?
- a. 0.5 m
  - b. 1.0 m
  - c. 1.5 m
  - d. 2.0 m
28. Hot water should be supplied through a thermostatic mixing valve at what outlet temperature (degrees C)?
- a. 34 °C
  - b. 43 °C
  - c. 50 °C
  - d. 65 °C
29. What is checked during commissioning at the appliance to ensure pipe sizes are correct on a hot water system?
- a. Pressure and flow rate.
  - b. Pressure and expansion rate.
  - c. Flow rate and discharge rate.
  - d. Temperature and turbulence.
30. What is the benefit of a system that has secondary circulation?
- a. It prevents water wastage.
  - b. It reduces the installation costs.
  - c. It increases the pressure at the appliance.
  - d. Smaller diameter pipes can be used.
31. Which of the following fuels is classed as being a renewable fuel source?
- a. Biomass.
  - b. LPG.
  - c. Natural gas.
  - d. Coal.
32. What is the **maximum** notch depth if a joist is 150mm deep?
- a. 22.75 mm
  - b. 20.75 mm
  - c. 15.75 mm
  - d. 18.75 mm

33. Which component on a sealed central heating system accommodates the expansion of water when it is heated?
- Expansion relief valve.
  - Expansion vessel.
  - Pressure gauge.
  - Cistern.
34. What is the correct source of information to ensure the correct radiator is installed in the correct room of a building?
- Radiator schedule.
  - Specification drawing.
  - Manufactures installation guide.
  - Bill of Quantities.
35. Why are radiators **best** hung at 150 mm off the floor?
- To allow air circulation around the radiator.
  - Prevent radiator valves resting on the floor.
  - So skirting boards can be painted.
  - To allow for cleaning underneath.
36. What is the consequence if rainwater collected in guttering at the eaves was allowed to discharge onto the soil around the building?
- Soil erosion.
  - Soil compaction.
  - Soakaway failure.
  - Improved soil conditions.
37. What are the **most** important things to be taken into account when sizing and choosing the guttering system on a property?
- Rainfall intensity, roof area, and gutter fall.
  - Material type, height, drainage system type.
  - Environmental factors, weight, labour availability.
  - Drainage connection, rainfall direction, durability.

38. What type of trap is shown in the image?

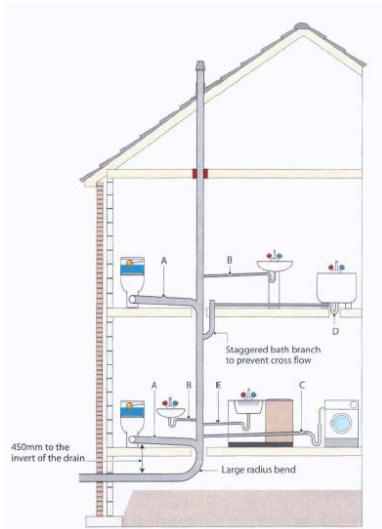


- a. Bottle trap.
- b. Resealing trap.
- c. Tubular P trap.
- d. Waterless trap.

39. What appliance would be **most** likely to use a dual flush valve in its operation?

- a. WC suite.
- b. Bath.
- c. Wash basin.
- d. Urinals.

40. What type of sanitary pipework system is shown in the image?



- a. Stub stack.
- b. Primary ventilated stack system.
- c. Ventilated discharge branch system.
- d. Secondary ventilated stack system.

41. What is the most appropriate reason why oil and LPG fuel systems are commonly used in rural areas?
- Bulk storage of the fuel is possible.
  - These fuels are the only two alternatives.
  - The cost of the fuel is always lower.
  - These fuels are more environmentally friendly.
42. How do we ensure the correct operation of a sub stack when installing?
- By adhering to specified measurements.
  - Always install antisiphonic traps on all appliances.
  - Increasing the pipe diameter of the wc connection.
  - Including a short radius bend at the base of the stack.
43. How should the following sequence of activities be re arranged to ensure the successful completion of a repair to a soil stack?
- Test repair.
  - Notify customer.
  - Carry out repair.
  - Wear correct PPE
  - Decommission appliance.
- 2, 4, 5, 3, 1.
  - 5, 4, 3, 2, 1.
  - 1, 3, 2, 5, 4.
  - 3, 2, 4, 1, 5.

**The below scenario should be used to answer questions 44 and 45**

Upstairs radiators in a 30 year old heating system in a dwelling get hot in the summer when the hot water cylinder is being heated from the central heating boiler.

44. What is the **most** likely reason for why this is occurring?
- Water from the expansion vessel is circulating around the pipework.
  - The time clock is switching on the pump in reverse due to incorrect wiring.
  - The radiators are being heated by means gravity of circulation.
  - The ambient air temperature is making the radiators hot.
45. The customer has requested to be able to control the hot water circuit as well as upstairs and downstairs heating independently and has been given the following advice.

‘To install a 3x2 port heating system’

What statement **best** reflects the advice given:

- The advice is correct, meets legislation and customer needs.
- The advice is incorrect meets legislation but not the customer needs.
- The advice is correct does not meet legislation or customer needs.
- The advice is incorrect does not meet legislation or meets customer needs.

**Applied knowledge and understanding:**

In Q44 The learner must show knowledge of the difference in density between hot and cooler waters and then be able to analyse its circulating capabilities through the connected pipework, thus selecting the best option. Q45 asks the learner to distinguish between the statements and only by understanding, recognition of legislation, energy conservation and installation requirements will they be able to compare the answers and select the correct solution in line with up to date regulations.

46. A ground floor flat in a 5 storey block is having problems with foam and waste water appearing in the bath and WC which are connected to the soil stack. The inspection chamber is checked but there is no blockage.

What is the **most** likely reason why this is happening?

- Incorrect type of traps used on appliances.
- Waste pipes enter stack at the incorrect gradient.
- Too many washing machines and dishwashers are connected to the stack.
- Connection at the base of the stack is less than 750mm to invert level.

**Applied knowledge and understanding:**

The candidate has been told that there is no blockage and they are then required to call upon their understanding of the regulations and issues which would arise should a fault occur. Analysing faults against their known symptoms will lead the learner to selection of the appropriate fault

47. Water is heated and stored at certain temperature range and blended at point of use'. Which of the below statements **best** supports this.
- a. Water is heated and stored at 60-65 degrees to eliminate lime scale and prevent bacteria growth.
  - b. Water is heated and stored at 60-65 degrees to eliminate electrolysis and prolong the life of the storage cylinder.
  - c. Water is heated and stored at 50-55 degrees to eliminate lime scale and prevent bacteria growth.
  - d. Water is heated and stored at 65-70 degrees to eliminate copper sulphates and prevent bacteria growth.

**Applied knowledge and understanding:**

The candidate will combine understanding of several pieces of information and by analysing the outcome of these combinations, ie effects of temperature upon water, will be able to evaluate the action of one on another. Their selection will be based on known relationships.

48. What reason **best** supports the below statement?  
'on a bath installation temperature blending valves are mandatory in new build properties'.
- a. Due to part G of the building regulations and to prevent scalding and limit temperature to 48 degrees.
  - b. To allow the customer to have full control of the temperature of the bathing temperatures.
  - c. Due to part L of the building regulations and to prevent scalding and limit temperature to 43 degrees.
  - d. Limiting temperatures to conserve energy and increase energy rating of the property.

**Applied knowledge and understanding:**

This question will need the candidate to demonstrate their knowledge and understanding of regulations and hot water storage and distribution. Candidates need to understand the relationship between these and the cause and effect of why such regulations are in place.

49. 22 mm copper tube and fittings are to be installed across the full length of two long and one short wall of a 3m by 2m room. Smoke alarms cannot be turned off in the property. Elbow fittings will be used in the corners. All joints are to be made in position with minimal wall damage.

Which list of materials will be suitable for the installation?

- a. 8 m of 22 mm copper tube, 2 x 22 mm push fit elbows.
- b. 7 m of 22 mm copper tube, 2 x 22 mm compression elbows.
- c. 8 m of 22 mm copper tube, 2 x 22 mm solder ring elbows.
- d. 7 m of 22 mm copper tube, 2 x 22 mm push fit elbows.

**Applied knowledge and understanding:**

The candidate will have to calculate the amount of tubing required from the specification and then will have to compare and contrast the difference in installation techniques between 4 types of fittings. The question asks for a technique which will cause least damage, all techniques if carried out correctly should not damage the wall surface, but there are 3 techniques which utilises tools more than the fourth, the learner will have to analyse them all and make a choice.

50. You are asked to look at 2 long horizontal heating pipes that pass through 4 walls. You see on either side of the wall broken plaster on the floor and plaster damage around the pipes. You have been told that the damaged plaster has been repaired and painted a number of times.

What is the **most** likely cause of the damage?

- a. No plastic tape on the pipe to stop the plaster sticking
- b. No paint applied to the pipe in the wall to allow the pipe to slide
- c. The wrong type of plaster used and no pipe covers used
- d. No sleeves on the pipe to allow movement of the pipe through the wall

**Applied knowledge and understanding:**

The question requires the candidate to demonstrate understanding that this material expands and contracts when heated and the movement has to be accommodated. Having established that they must evaluate the most likely cause of the damage.

51. On a cold water installation the pipes are under the floor are close to a 22 mm hot water pipe. The customer is complaining that the cold water supply is warm and a considerable amount of water has to be run off before it goes cold. Following investigation, work needs to be carried out to rectify the problem.

Which statement **best** reflects the most cost effective solution?

- a. Insulate the hot and cold water pipes to prevent heat transfer.
- b. Increase the cold water pressure to run off water quicker.
- c. Re-site the hot water pipe further away from cold pipe.
- d. Re-route the cold water pipe away from the hot water pipe.

**Applied knowledge and understanding:**

The candidate will have to analyse the information in order to make a judgement. The candidate will have to draw on various pieces of knowledge and understanding such as insulation requirements. The candidate would then need to understand the work that is required and break this down to estimate costs of the work needed. From this information the candidate needs to make the decision on what work is carried out that gives the best value for money.

52. A newly installed guttering system is over flowing at peak rainfall periods. The owner of the property called a plumber, who identified the current system had no blockages and was operating as designed.

Which statement **best** reflects the most cost effective solution?

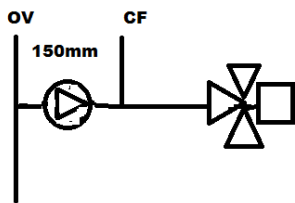
- a. Reduce the pitch of the roof to slow down the discharge.
- b. Replace the full system with a high capacity type.
- c. Increase the length of guttering to allow for excessive rainfall.
- d. Increase the roof area to capture more rainfall at peak times.

**Applied knowledge and understanding:**

The candidate has been told that a newly installed guttering is overflowing. By analysing why the overflowing is happening, they can determine what are the correct factors are. This results in a known quantity of water reaching the eaves of the building so making the correct selection.



53. Using the diagram identify the type of central heating system this relates too and then define what would be the consequences when the system is in operation.



- Open vented system under negative pressure which is drawing air into the system.
- Open vented system under positive pressure which is drawing air into the system
- Sealed system under negative pressure which is drawing air into the system
- Sealed system under positive pressure which is drawing air into the system

**Applied knowledge and understanding:**

This question requires the candidate to analyse the position of the pump, which generates energy, and its position between OV and CF. Candidates will need to understand the relationship between CF and the neutral point and that the OV is on the suction side of the pump so reducing water level

54. You are called in to investigate a wash basin waste that is blocked. What you find is a 32 mm waste pipe connected into the soil stack in the shaded area as highlighted on the drawing.

Which statement explains the situation?



- Legislation allows connections in shaded area if pipe diameter is greater than 32 mm.
- Legislation forbids any connections other than WC in the shaded area.
- Legislation forbids any connections in the shaded area due to cross flow.
- Legislation allows connections in the shaded area as long as they have cleaning access.

**Applied knowledge and understanding:**

This question will require the candidate to demonstrate their understanding of above ground drainage legislation and apply it to the situation. Candidates will need to analyse the information given alongside the implications of making connections in the shaded area.

55. Below are four pictures of heat emitters which could be connected to a central heating system.

Select the sequence of letters which correctly identifies them in the correct order as a skirting radiator, a convector radiator, a plinth heater and a column radiator.



a



b.



c



d

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

56. We have two connections on a cold water storage cistern providing balanced hot and cold supplies to a shower block via a cistern and an indirect hot water cylinder.
1. Cold feed to hot supply via an indirect hot water cylinder
  2. Cold feed direct to showers

What is the correct statement with regards to positioning of connections within the cistern?

- a. Cold feed supply connection direct to the showers must be higher than the supply to the hot water cylinder to prevent scalding.
  - b. Cold feed supply connection to the hot water cylinder must be higher than the cold outlet direct to the showers to prevent scalding.
  - c. Cold feed supply connection to the hot water cylinder must be from the bottom of the cistern to prevent scalding and scale build up.
  - d. Open vent connection to the hot water cylinder must be from the bottom of the cistern to prevent scalding and scale build up.
57. How much pressure should a rigid hot water pipework system with a maximum working pressure of 4 bar be tested to according to the water regulations?
- a. 9 bar.
  - b. 8 bar.
  - c. 7 bar.
  - d. 6 bar.
58. The incoming water flow rate to a property has been confirmed at 8 litres/ minute, what is the reading in litres/ second?
- a. 0.08 litres/ second.
  - b. 0.1 litres/ second.
  - c. 0.13 litres/ second.
  - d. 0.15 litres/ second.
59. Which document should be referred to for guidance on the commissioning requirements for a central heating boiler?
- a. BS 6700: 2009.
  - b. Manufacturer's instructions.
  - c. Water supply (Water Fittings) Regulations.
  - d. Domestic Building Services Compliance Guide.

60. A plumber is to undertake work in a school gymnasium, replacing rainwater pipes connected to roof outlets, which will require them working off a tower scaffold. The plumber has attended a training session on the potential dangers and precautions required during use of tower scaffold. The company they work for employs a person who has been trained in tower scaffold erection and is competent.

Which of the following best outlines the correct procedure to be followed

- a. Competent person erects tower scaffold/plumber inspect on a daily basis and make any notes/competent person inspect on a weekly basis.
- b. Competent person erects tower scaffold/ plumber inspect on a weekly basis making notes and submits a report to their supervisor.
- c. Plumber erects the tower scaffold the competent person inspects it the day after and says all is correct/ competent person inspects on a weekly basis.
- d. Plumber erects the tower scaffold using supplied instructions/plumber inspects on a daily and weekly basis and submits report.

**Applied knowledge and understanding:**

The question requires the learner to demonstrate understanding that the training course the plumber has attended is not the course on erecting and dismantling tower scaffolds. Therefore does not make the plumber competent. They must evaluate the options and select the solution which would stand up to analysis.

## 2 Mark scheme

### 2.1 Multiple choice

Question	Key
1	A
2	B
3	A
4	B
5	D
6	A
7	A
8	A
9	A
10	A
11	B
12	B
13	A
14	A
15	A
16	D
17	A
18	C
19	A
20	C
21	A
22	A
23	D
24	B
25	D
26	A
27	B
28	B
29	A
30	A

Question	Key
31	A
32	D
33	B
34	A
35	A
36	A
37	A
38	C
39	A
40	B
41	A
42	A
43	A
44	C
45	A
46	D
47	A
48	A
49	A
50	D
51	A
52	A
53	A
54	C
55	D
56	A
57	D
58	C
59	D
60	A

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