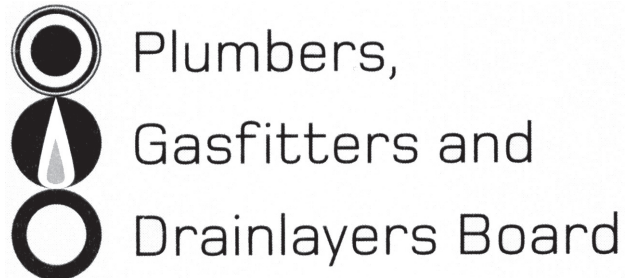


No. 9197



REGISTRATION EXAMINATION, NOVEMBER 2014
LICENSED DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

- (a) (i) Fill with water to appropriate level and check for water tightness. (1 mark)
(ii) Put a dye solution in and look for trail of dye colour. (1 mark)
- (b) Any TWO (1 mark each)
- Secure the plugs in place or allow the temperature to stabilise.
 - Reduce the test pressure to suit the pipe diameter (for 600 mm the test pressure should not exceed 4 kPa).
 - Use a low pressure test. (2 mark)

Total 4 Marks

ANSWER 2

- (a) • Oxygen is supplied to the bacteria in the tank so the bacteria can break down the waste products. (3 marks)
- (b) Any TWO (1 mark each)
- Temperature.
 - Density of contents.
 - Composting, breakdown of solids.
 - Flow rate/baffles/tank size. (2 marks)
- (c) Scum.
Effluent (liquid).
Sludge. (2 marks)
- (d) Plants absorbing liquid via their root systems and releasing the moisture to the air through their leaves. (2 marks)
- (e) Any THREE (1 mark each)
- The effluent is stirred up disrupting the settling process.
 - The effluent is pushed through the system too quickly not allowing enough time for bacteria to treat the waste.
 - The disposal field is forced to absorb too much liquid.
 - Oil from yards contaminate the tank. (3 marks)
- (f) Any SIX (½ mark each)
- Antibiotics.
 - Paint.
 - Bleach/disinfectants.
 - Herbicides/pesticides.
 - Oil.
 - Automobile fluids.
 - Water softeners.
 - Stormwater. (3 marks)

- (g) Any ONE (1 mark)
- To keep the tank at a constant temperature.
 - To provide fall for gravity fed systems.
- (1 mark)

Total 15 Marks

ANSWER 3

- (a) Any THREE (1 mark each)
- Get a vaccination against Hepatitis.
 - Always wear rubber gloves when working on existing foul water drains.
 - Thoroughly clean all equipment and tools with a quality disinfectant immediately after finishing the work.
 - Wash your hands frequently and especially before eating or smoking, using a quality antibacterial/ antiviral preparation.
 - Avoid splashes to unprotected skin.
 - Use PPE.
- (3 marks)

- (b) (i) • Damage to the workers' hands from the plaster. (1 mark)
- (ii) • Wear rubber or other impervious gloves. (1 mark)

Total 5 Marks

ANSWER 4

- (a) Any THREE, (1 mark each)
- Higher pressure rating.
 - Longer lengths can be used.
 - Fewer joints needed.
 - Higher impact resistance.
 - More flexible.
 - Less prone to chemical attack.
 - More laying technique options.
- (3 marks)

Pipe Material	Joining Method
High Density Polyethylene	Electrofusion joint / butt welding / banded clamp
Earthenware	Rubber ring / banded clamp / mortar
uPVC	Primer and solvent cement / rubber ring / banded clamp
Copper	Brazed joint / rubber ring / welded

(4 marks)

Total 7 Marks

ANSWER 5

- (a) (i) 3.15 m (1 mark)
(ii) 11.39 m (1 mark)
- (b) (i) 1:32 OR 3.09% (1 mark)
(ii) 1:131 OR 0.764% (1 mark)

Total 4 Marks

ANSWER 6

- (a) Volume = $0.6 \times 0.9 \times 0.5$ (1 mark)
= 0.27 m^3 (1 mark) (2 marks)
- (b) Radius = 0.5 m Height = 1 m (1 mark each)
Volume = $\pi \times 0.5^2 \times 1$ (1 mark)
= 0.785 m^3 (1 mark)
= 785 litres (1 mark) (5 marks)

Total 7 Marks

ANSWER 7

- (a) Work that is more than usually dangerous. (1 mark)
- (b) Worksafe NZ. (1 mark)
- (c) Any THREE, 1 mark each
- Work where workers could fall five metres or more, excluding work on a two-storey house, or work on a power or telephone line, or work carried out from a ladder only, or maintenance or repair work of a minor or routine nature.
 - The erection or dismantling of scaffolds from which a person could fall five metres or more.
 - Every excavation more than 1.5 m deep in which people are required to work and which is deeper than it is wide at the top.
 - Any form of tunnel or drive where workers work underground, irrespective of timbering or support.
 - Those excavations where the excavated face is steeper than one horizontal to two vertical.
 - Any construction work where explosives are used or stored.
 - Work such as diving, where construction workers breathe air or any other gas that has been compressed or is under pressure.
 - Lifts of half a tonne (500 kg) or more a vertical distance of 5 m or more carried out by use of a lifting appliance other than by a mobile crane, excavator or forklift.

(3 marks)

Total 5 Marks

ANSWER 8

- (a) Any THREE (1 mark each)
- Tree roots.
 - Insufficient gradient.
 - Obstructive material being put down the drain.
 - Oversize drain.
- (3 marks)
- (b) 1 mark for each correctly identified item.
- Weir.
 - Water seal depth.
 - Soffit.
 - Invert.
- (4 marks)

Total 7 Marks

ANSWER 9

- (a) Any THREE (1 mark each)
- Overloaded circuits.
 - Flexible extension cords being damaged by sharp edges.
 - Electrical equipment being used in wet conditions.
 - Tripping.
 - Traffic.
- (3 marks)
- (b) Any TWO (1 mark each)
- An isolating transformer with a voltage between conductors not exceeding 230 Volts.
 - An earth circuit that is monitored. If it is broken or disconnected, the power to the appliance will automatically be disconnected.
 - A source to earth connection so that the earth voltage does not exceed 55 Volts.
 - A residual current device (RCD).
- (2 marks)
- (c) Any FOUR (1 mark each)
- Spirit level.
 - Laser level.
 - Smart level.
 - Builder's/dumpy level.
 - Water filled hose.
 - Pipe laser.
- (2 marks)

Total 7 Marks

ANSWER 10

Situation	Pump selected
Pumping out a trench.	B
Pumping effluent to a disposal field.	A
Pumping high pressure water for an irrigation system.	C

Total 2 Marks**ANSWER 11**

- (a) The straight pipe length must be not less than twice the bore of the pipe. (1 mark)
- (b) 300 mm. (1 mark)
- (c) Where the stack extends no more than two floors. (1 mark)

Total 3 Marks**ANSWER 12**

- (a) Any THREE (1 mark each)
- Straight and of even gradient.
 - Separated from the building foundation by at least 25 mm.
 - When passing through concrete, sleeved or wrapped in a durable and flexible material to allow for expansion and contraction.
 - 50 mm clearance from the top of the pipe to the underside of the slab.
 - Junctions beneath the building joining at an angle of not more than 45°. (3 marks)
- (b) To provide access for cleaning and clearing blockages. (1 mark)
- (c) Any THREE (1 mark each)
- Immediately prior to drain outfalls,
 - Immediately inside the boundary of the property served,
 - At the junction of every drain with another drain except that no access point is required where the branch drain is less than 2.0 m long and only serves a gully trap,
 - Every change in horizontal direction of greater than 45°,
 - Every change in gradient greater than 45°,
 - At intervals (on straight lines) of no less than:
 - (i) 50 m where rodding points are used, or
 - (ii) 100 m where access chambers, inspection chambers or inspection points are used, and
 - Within 2.0 m outside the building where a drain enters or exits from under a building.

(3 marks)

Total 7 Marks

ANSWER 13

Section	Fall	
B – C	0.0577 m	(½ mark)
C – D	0.066 m	(½ mark)
D – E	0.1403 m	(½ mark)
E – F	0.0495 m	(½ mark)

Point	Depth	
A	Ground Level	
C	1.0577 m	(1 mark)
D	1.1237 m	(1 mark)
E	1.264 m	(1 mark)
F	1.3135	(1 mark)

Total 8 Marks**ANSWER 14**

(a) Any ONE (1 mark)
 Foul water is contained in the drain.
 Less sewer gas / better ventillation. (1 mark)

(b) Any ONE (1 mark)
 A blockage site can be easily determined.
 Can be unblocked without entry. (1 mark)

Total 2 Marks**ANSWER 15**

Measurements correct (7 marks)

Total 7 Marks**SECTION B**

1. A Litre.
2. C To allow for settling of soil around the drain.
3. B A system that removes ground water before excavation.
4. E 60°
5. D 255
6. A To prevent trap seal loss due to compression.
7. D 600 mm
8. A 150 mm
9. B 3.000 m
10. B 150 mm

Total 10 Marks