No. 9197

Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2015

LICENSED DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

(a) Effluent (1 mark)

(b)
- Cuts or punctures to the skin
- Digestion (eating)
- Breathing
- Eyes (3 marks)

(c) Any THREE (1 mark each)
- Tetanus
- Hepatitis B
- Hepatitis A
- Giardia
- Salmonella (3 marks)

(d) Any THREE (1 mark each)
- Wear gloves
- Wear breathing apparatus
- Wear eye protection
- Wear overalls
- Be innoculated (3 marks)

(e)
- Wash hands (in cold water)
- Use disinfectant to clean the area
- Clean tools after work is completed
- Remove soiled clothing (3 marks)

Total 13 marks

ANSWER 2

Name:	Surface water sump	(1 mark)
Function:	Trap silt and debris before it enters the system	(1 mark)
Situation:	Large open area to remove/collect surface water	(1 mark)

Name:	Dry inspection chamber	(1 mark)
Function:	To allow drain access from ground level	(1 mark)
Situation:	Any ONE Where inspection cap is less than 1 m below ground level Any any inspection spewing requirement	(1 mark)

Name:	Petrol trap	(1 mark)
Function:	Remove grit and gases before they enter the system	(1 mark)
Situation:	Where petrol/oil is likely to be spilled	(1 mark)

Name:	Soak pit	(1 mark)
Function:	Help remove surface water by encouraging soakage into the ground	(1 mark)
Situation:	Where there is no access to surface water system	(1 mark)

Total 12 marks

ANSWER 3

(a) To prevent sewer surcharge back flowing into a drainage system OR to prevent surface water backflow from rivers/estuaries etc.

(1 mark)

(b) Answers are to describe situations where surcharging from a sewer occurs and an ORG trap cannot be installed. For example: sewage ejecting system or pumping system or surface water flooding.

(1 mark each) (3 marks)

(c) To prevent settlement/deflection. (1 mark)

(d) Any TWO (1 mark each)
The pipe may flatten.
The pipe may float.
The trench may subside.
Joints in pipes may fail. (2 marks)

Total 7 marks

ANSWER 4

(a) Area of roof = 6 × 5 = 30 m^2 (1 mark)
Area of driveway = 8 × 4 = 32 m^2 (1 mark)
Total area = 62 m^2 (½ mark)
Volume = 62 × 0.085 = 5.27 m^3 (1½ mark)

(4 marks)

(b) 5.27 x 1000 = 5,270 ltrs (1 mark)

Total 5 marks

ANSWER 5

(a) Any THREE (1 mark each)
- Drainage spear
- Tracer wire and cable locator
- Camera and locator
- Ultra sound – radar – geophysics equipment (3 marks)

(b) Any TWO (1 mark each)
- They are fragile and can go out of calibration if knocked – ground stability
- The laser can cause eye damage and should not be set up at a level that may shine into the eyes of people near the site
- The maximum reach of the laser beam
- Any obstructions to the laser beam (line of sight)
- Atmospheric conditions/weather/temperature
- Land contoour (2 marks)

(c) Any FOUR (½ mark each)
- uPVC
- Fibre reinforced concrete
- Glass reinforced polymer
- Cast Iron
- Copper
- Polyethylene HD or LD
- Acrylonitile butacliene styrene
- Steel
- Concrete
- Ductile iron
- Polypropylene (2 marks)

(d)
- Where drains travel through external walls below ground
- Where differential settlement may occur and a drain passes through the wall of an inspection chamber/chambers
- Prior to a jump-up (3 marks)

(e) Diagram to show a joint with a flexible joint, with labels. (2 marks)

Total 12 marks

ANSWER 6

(a) Any FIVE (1 mark each)
- Cap and brace openings.
- Soak pipe work for 24 hours.
- Fill pipe with water ensuring all air is expelled.
- Top up water to test head level – 1.5 m above head of drain no more than 6.0 m above base of drain. Time = 30 minutes.
- Leave for 30 minutes.
- Check amount of water loss is within acceptable limits.

OR
- 1 m – 3 m head
- Time = 15 minutes
- Check the amount of water is within acceptable limits. (5 marks)

(b)
- When the correct gradient cannot be achieved. (2 marks)

(c) Diagram to show:
- An access cover
- An inlet (above the base level of the chamber)
- An outlet (at higher level than the inlet)
- Flow direction arrow from inlet to outlet (4 marks)

Total 11 marks

ANSWER 7

(a) Any THREE (1 mark each)

- The surface is clear of plant, spoil heaps, materials, etc. for at least 600mm from the edge of the excavation
- Spoil heaps are properly controlled and stay controlled in wet weather
- When working on spoil heap the trench is clear of employees
- The space between the trench and the spoil heap to remain clear of pipes, bricks, stones, tools etc.
- Toe boards along the top of the trenches
- Determine if the work is notifiable (3 marks)

(b) Any THREE (1 mark each)

- Ensure access adequate without anyone having to jump across
- Footbridges with guard rails available and being used ladders available and being used
- Others outside trench are made aware of people entering trench
- Ladders are available

(3 marks)

(c) Any THREE (1 mark each)

- Work area is properly fenced off
- Signage is in appropriate places
- Lit during the night
- If required, guarded
- Temporarily backfill
- Covered (3 marks)

Total 9 marks

ANSWER 8

A Name: Aerated chamber. (1 mark)
Purpose: To supply oxygen to the aerobic bacteria within the septic tank.
OR
To allow the effluent to be further treated (therefore cleaner) by the aerobic bacteria before leaving the tank.
(1 mark)

B Name: Dosing chamber (pump). (1 mark)
Purpose: To dose the system by discharging a set volume of effluent into the disposal system.
OR
Spread the load over the entire disposal field, stop the first section of the field absorbing all the effluent whilst the far end of the field remains dry.
(1 mark)

C Name: Distribution box (diverting, diverter or valve box). (1 mark)
Purpose: To allow the effluent to be diverted to different disposal fields.
OR
To allow parts of the effluent field to 'rest' and recover. (1 mark)

D Name: Drip-line effluent disposal field. (1 mark)
Purpose: To transfer effluent to the surrounding soil/mulch. (1 mark)

Total 12 marks

ANSWER 9

Drawn correctly **Total 7 marks**

ANSWER 10

(a)

Section	Length	Fall
A – B	6 metres	75 mm (½ mark)
B – C	10 metres	125 mm (½ mark)
C – D	20 metres	250 mm (½ mark)
D – E	15 metres	187.5 mm (½ mark)

(b)

Point	Depth in mm
A	400 mm
B	475 mm (1 mark)
C	600 mm (1 mark)
D	850 mm (1 mark)
E	1037.5 mm (1 mark)

Total 6 marks

SECTION B

1. E 600 mm
2. D 205
3. E 1:100
4. B 150 mm
5. A 150 mm
6. C 100 litres
7. C 30
8. B 2
9. A 2 m
10. C 60°

Total 10 marks