

QUESTION 1 – Water Supplies

- a) Water mains should be periodically tested. What are the two most important aims in doing this? **(4 marks)**

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- b) List five inspection criteria for fire hydrants - what are they? **(5 marks)**

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- c) To which organisation do you report these faults? **(1 mark)**

- d) When undergoing flow test, fire hydrants must be turned on and off slowly over a period of how long? **(1 mark)**

- e) Water mains should be tested through key hydrants how frequently? **(1 mark)**

- f) Name two criteria for determining indexed or key hydrants. **(2 marks)**
1.

2.

- g) Explain and draw diagrams to demonstrate how to flow test. **(6 marks)**

QUESTION 2 – Short Answers

Fill in the spaces as indicated.

a) Most fog nozzles perform best at _____ kpa. **(1mark)**

b) Most foam nozzles perform best at _____ kpa. **(1 mark)**

c) Explain Jet Reaction. **(2 marks)**

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d) Explain two reasons why overrunning the water supply is to be avoided. **(2 marks)**

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e) Explain Water Hammer. **(2 marks)**

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f) What is residual pressure? **(2 marks)**

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g) What happens if the residual pressure reaches zero? **(2 marks)**

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h) Explain static pressure. **(2 marks)**

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i) The air pressure at sea level in a standard atmosphere is _____ kpa. **(2marks)**

j) At standard atmospheric pressure, how much lift should this be able to provide? **(2 marks)**

i) theoretically

ii) practically

k) Each 10 kpa drop in atmospheric pressure will decrease the effective lift by how much?
(2 marks)

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QUESTION 3 – Long Answers

List the **five** principal laws that govern the loss of pressure due to friction in a water relay and in your own words, explain how each of these factors needs to be taken into consideration when operating a water relay. **(20 marks)**

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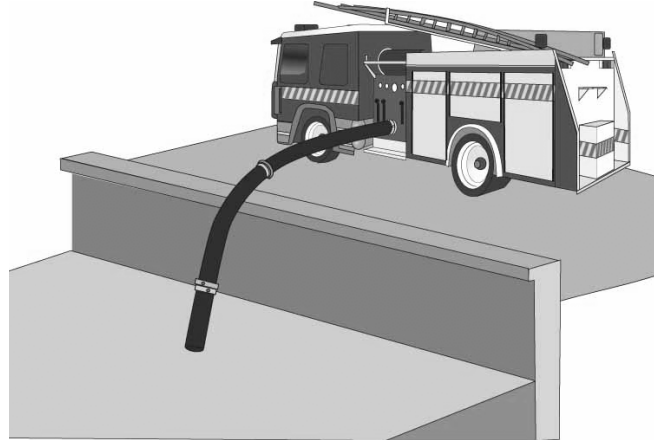
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QUESTION 4 - Mathematics



- a) Calculate the capacity of water using the following dimensions in a swimming pool. **(4 marks)**

Length = 14m

Width = 9m

Depth at one end 1m

Depth at the other 1.9m

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- b) If the pool was full, how long will this amount of water last, using two branches at 8 l/s (480l/m) each? (Convert to hours and minutes) **(4 marks)**

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- c) Calculate the volume of water in a cylindrical water tank. Show all workings. **(6 marks)**

Circumference is 8m and it is 3m full

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- d) If running one hose reel and TFT Ultimatic nozzle (output 4 l/s or 240 l/m) to fight a scrub fire, how long have you got until the water runs out from the cylinder above? (Convert to hours and minutes). Show all workings. **(4 marks)**

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- e) A fire crew requires 700kpa at the branch and is working 20 metres below the pump. Disregarding losses other than those due to head, calculate pressure required at the pump. Show all workings. **(2 marks)**

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QUESTION 5

- a) Using the acronym CRESTA, explain these practical considerations when pumping from an open water supply. **(10 marks)**

C	_____

R	_____

E	_____

S	_____

T	_____

A	_____

- b) Pressure loss in suction hose is governed by the same factors that apply with delivery hose. Name four. **(4 marks)**

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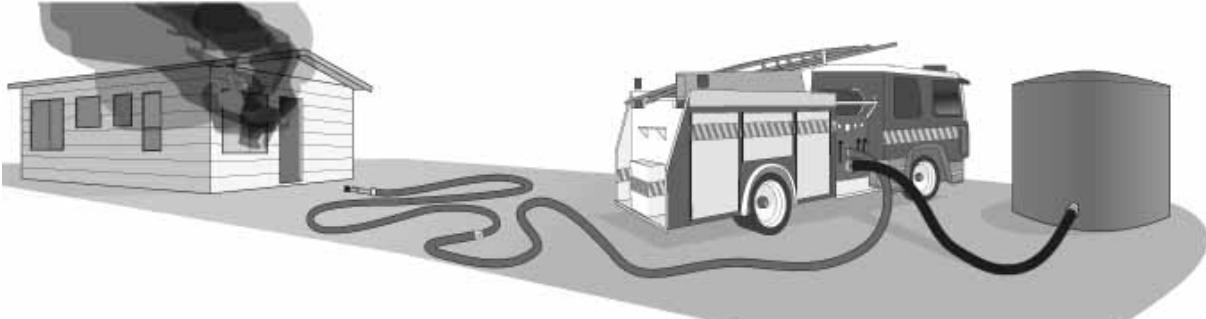
c) If water temperature was higher than 88 degrees C, what is the approximate lift height?
(2 marks)

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d) Explain the principals behind draughting. Draw a diagram to demonstrate. **(4 marks)**

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QUESTION 6



- a) If the crew were working on top of a single storey dwelling with a branch and hose made up of one 45mm and one 70mm hose, what would the pump pressure need to be to have 700kpa at the branch? Show all workings. **(4 marks)**

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- b) Optimal nozzle pressure is the pressure which the nozzle performs at its best. List five advantages of using the nozzle at its optimum pressure. **(5 marks)**

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c) A ground monitor is used with a nozzle of 38mm at 700kpa. What is the discharge in l/sec?
Show all workings. **(5 marks)**

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d) A stream has a width of 6m and depth of 0.5m. To estimate the rate of flow, you have
thrown a stick into the water and it travels 1 metre in 6 seconds. Work out the rate of flow
in litres per second and show all workings. **(6 marks)**

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