UNIVERSITY
OF
JOHANNESBURG

FACULTY	: Education
DEPARTMENT	: Science and Technology Education
CAMPUS	: APK
MODULE	: CTE10A2 CIVIL TECHNOLOGY 2A
SEMESTER	: First
EXAM	: May 2018

DATE	: 12 June 2018	**SESSION**	: 16:30-18:30
ASSESSOR(S)	: DR CF VAN AS		
MODERATOR	: MR W ENGELBRECHT		
DURATION	: 2 HOURS	**MARKS**	: 120

NUMBER OF PAGES: 6 PAGES

INSTRUCTIONS:

1. Answer ALL the questions.
2. Number your answers clearly.

QUESTION 1

1.1 Briefly discuss the contribution of civil engineering to human health and quality of life. **(6)**

1.2 Surface water and groundwater should in most cases be treated to make it fit for domestic use. Briefly discuss the conventional treatment process. **(8)**

[14]

QUESTION 2 Cold water supply

2.1 Certain technical aspects should be taken into account when planning a water supply system. Briefly explain your understanding regarding the following aspects:

2.1.1 Communication pipe from main.
2.1.2 Isolating valve before the LA water meter.
2.1.3 LA water meter.
2.1.4 Stop valve.
2.1.5 Service pipe.
2.1.6 Pressure control valve.
2.1.7 Minimising pipe length and directional changes. **(14)**

2.2 Copy the table below in your answer book and compare the following types of water pipes with each other regarding the following headings:

- Properties that make it suitable for the application.
- Method of joining.

	Pipe material	**Properties**	**Method of joining**
2.2.1	Copper	(2)	(2)
2.2.2	Galvanised iron	(2)	(2)
2.2.3	Polypropylene (PP)	(2)	(2)

(12)
[26]

QUESTION 3 Hot water supply

3.1 Figure 1 shows an illustration of an electrical pressurised geyser that is commonly used in domestic buildings in urban areas. Study the illustration thoroughly and answer the following questions:

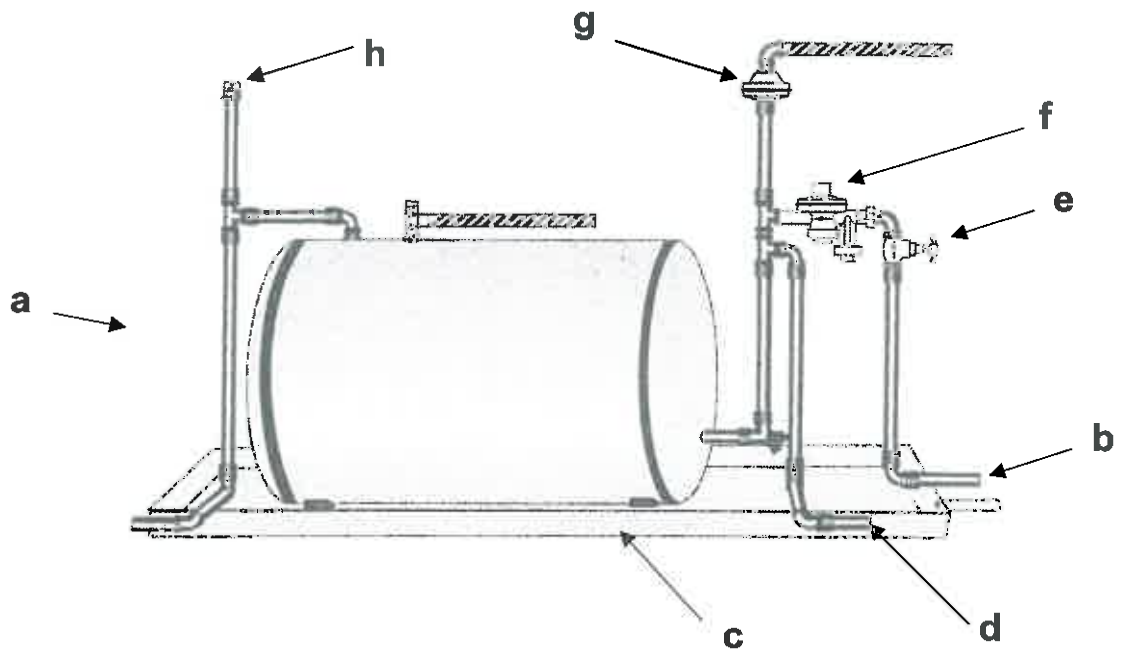

Figure 1

3.1.1 Briefly explain the functioning of an electrical pressurised geyser by referring to the illustration above. **(6)**

3.2.2 Write down the letters **c** to **h** and identify that specific part of the installation. **(6)**

3.2 A person in a remote rural setting where electricity from the national grid is not available needs to install an appropriate hot water system. Motivate which system would be the most suitable by comparing the various systems to each other and by referring to, inter alia, functioning, cost, etc. **(6)**

[18]

QUESTION 4 Sewerage

4.1 In most urban areas sewage is collected from domestic buildings and drained into a system of pipes and sewers that ends at a sewage treatment plant. In cases where no sewage treatment plant exists, other measures must be taken to collect and remove the sewage. Motivate which system would be the most suitable by comparing the various appropriate systems and referring to, inter alia, functioning, cost, etc. **(10)**

4.2 Figure 2 shows an illustration of a bath and wash basin connected to the main drainage system. Study the illustration thoroughly and answer the questions that follows.

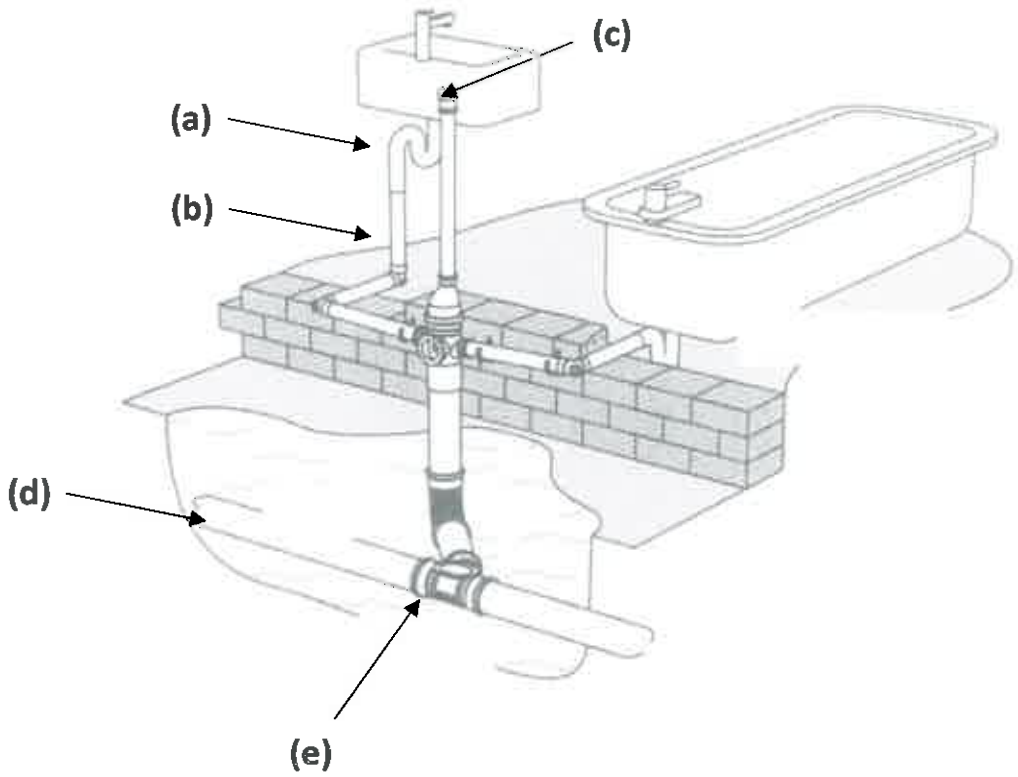

Figure 2

4.2.1 The drainage system shown in Figure 2 consists of pipes, joints, bends and accessories from Marley pipe systems. Which type of material has been used in this case? **(1)**

4.2.2 What do we call part (**a**)? **(1)**

4.2.3 What is the function of part (**a**)? **(1)**

4.2.4 What is the diameter of the pipe shown at (**b**)? **(1)**

4.2.5 What do we call part (**c**)? **(1)**

4.2.6 What is the function of part (**c**)? **(1)**

4.2.7 What is the diameter of pipe (**d**)? **(1)**

4.2.8 Apart from joining pipes, what other function does fitting (**e**) have? **(1)**

[18]

QUESTION 5 Storm water

5.1 Development has a huge influence on the natural water cycle. Compare the water cycle in a natural area with that of a suburban or urban area. **(6)**

5.2 State the three (3) rules that are generally applicable throughout the world today as far as the drainage of surface runoff is concerned. **(3)**

[9]

QUESTION 6 Electrical system

6.1 It is currently a worldwide trend to move away from the use of non-renewable energy resources for the generating of electricity to more renewable energy resources. Motivate which system, according to you, would be the most suitable by comparing the various systems to each other and by referring to, inter alia, functioning, cost, etc. **(4)**

6.2 Domestic circuits are wired with three conductors. The isolation of these conductors has standard colours to ease wiring. Copy the table below in your answer book and fill in the open spaces:

Colour of isolation	Conductor	Code
		L
		N
		E

(6)

6.3 Briefly explain the purpose of an earth leakage unit. **(2)**

[12]

QUESTION 7 Finishing

7.1 Name four (4) aspects that should be kept in mind when preparing a wall surface for plastering. **(4)**

7.2 When choosing flooring for a certain area of a building there are certain aspects you should consider. Name any three (3) such aspects. **(3)**

7.3 Motivate your choice for covering each of the following floor surfaces:

7.3.1 Bedroom. **(2)**

7.3.2 Bathroom. **(2)**

7.4 Briefly explain the purpose of ceilings in house construction. **(2)**
[13]

QUESTION 8 Sustainability of materials

You are a cabinet maker and have to decide between paint and varnish as a protective coating for a wooden cabinet. Compare the two concepts with each other by referring to preparation, application and aesthetical aspects. Make a choice between the two methods and motivate your answer. **[10]**

TOTAL: 120