

POLITEKNIK
Jabatan Pengajian Politeknik

EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION
(MINISTRY OF HIGHER EDUCATION)

CIVIL ENGINEERING DEPARTMENT

FINAL EXAMINATION

JUNE 2012 SESSION

CN203: WATER SUPPLY ENGINEERING

DATE : 21 NOVEMBER 2012

DURATION : 2 HOURS (8.30AM – 10.30 AM)

This paper consists of **SIX (6)** pages including the front page.

Section A: Objective (20 questions – answer all)

Section B: Essay (4 questions – answer 3 questions)

CONFIDENTIAL

**DO NOT OPEN THIS QUESTION PAPER UNTIL INSTRUCTED BY
THE CHIEF INVIGILATOR**

(CLO stated at the end of each question is referring to the learning outcome of the topic assessed. The CLO stated is only for lectures' references.)

SECTION A**OBJECTIVES (40 marks)**

Instruction: This section consists of 20 objective questions. Write your answer's in the answer booklet.

1. _____ is the amount of water supply project which is expected to meet community needs CLO 2 : C1
2. _____ percent of total water supply is use for domestic purpose. CLO 1 : C3
3. The main components hydrologic cycle are surface runoff, _____, evaporation. CLO 2 : C1
4. Main microbes found in the raw water are bacteria, algae, viruses and _____. CLO 2 : C1
5. Acidity of the raw water due to the presence of high _____. CLO 3 : C3
6. _____ is mixed with treated water to kill bacteria. CLO 3 : C4
7. Mixing of chemicals with raw water to fine particles and colloidal material together into large precipitates mentioned _____. CLO 3 : C4

8. Chemicals used in the coagulation process called alum or _____ CLO 3 : C2
9. _____ is the process of channeling the water through layers of rock and sand CLO 3 : C4
10. _____ is the final process in water treatment CLO 3 : C4
11. Friction _____ occurs because the water particles to the surface of the pipe. CLO 2 : C4
12. Demand per capita is the _____ average demand for the use of a person in a day. CLO 2 : C1
13. Assumptions used in the _____ method are population increasing at the fixed rate. CLO 2 : C3
14. _____ is the quantity of oxygen required by the oxidizing agents for oxidation of all organic matter into carbon dioxide, water and ammonia CLO 3 : C4
15. _____ system simple, low cost of installation and minimum use of pipe. CLO 2 : C4
16. Fine filter is made up of nets attached to particles of size less than 5 mm is blocked from entering pumping system of the treatment plant. CLO 3 : C4
- (True or False)

17. The main purpose of aeration in water treatment process is to increase the dissolved oxygen content in water. CLO 3 : C1
(True or False)
18. Gravity method is used when the water supply is the same level or higher than the level of storage tanks. CLO 2 : C3
(True or False)
19. Valve necessary to control the water flow, stop the flow of water, release the air trapped in the water, balancing pressure in the pipe and remove the dirt in the pipes. CLO 2 : C4
(True or False)
20. The purpose of coagulant agent in water treatment process is to eliminate the germs in the water. CLO 2 : C3
(True or False)

SECTION B**ESSAY (60 marks)**

Instruction: This section consists of 4 essay questions. Answer **THREE (3)** questions.

QUESTION 1

- (a) Define domestic water Demands CLO 2 : C2
(3 marks)
- (b) List **FIVE (5)** usage of domestic water use. CLO 2 : C1
(5 marks)
- (c) A community has experienced the growth in population as shown in **Table 1**. Estimate the population in year 2010 using Geometry Method. CLO 2 : C4
(12 marks)

Year	1950	1960	1970	1980	1990
Population	8000	8990	11,300	14,600	18,400

Table 1**QUESTION 2**

- (a) List **FIVE (5)** physical water-quality parameters. CLO 1 : C1
(5 marks)
- (b) Define “hardness” of water. CLO 1 : C2
(3 marks)
- (c) Explain briefly **TWO (2)** classification of hardness. CLO 1 : C3
(6 marks)
- (d) Discuss briefly the impacts of hardness. CLO 1 : C4
(6 marks)

QUESTION 3

- (a) Define aeration. CLO 3 : C2
(3 marks)
- (b) State **FOUR (4)** methods of aeration of raw water in water treatment process. CLO 3 : C1
(6 marks)
- (c) With an appropriate diagram, describe the deposition process using a rectangular sedimentation basin. CLO 3 : C4
(11 marks)

QUESTION 4

- (a) List **SEVEN (7)** sources of Non Renewable Water (NRW). CLO 2 : C1
(7marks)
- (b) Describe briefly the advantages and disadvantages of water distribution network system using a grid system. CLO 2 : C3
(7 marks)
- (c) Explain briefly how visual inspection undertaken to detect leak in the delivery pipe. CLO 2: C4
(6 marks)