

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
300 level 2nd Semester Examination – December/January 2018
MRT 384-2 Water Supply Engineering



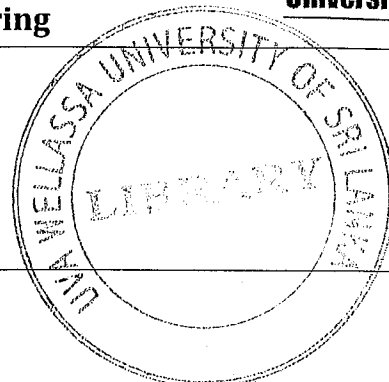
Instructions to candidates

Duration: 02 hours

Number of questions: 04

Mark allocation: 100 Marks

Answer all questions



1.

- a. Briefly explain the importance of "Population determination" in water supply projects. (5 Marks)
- b. State four (04) factors which affect the population growth with necessary examples. (2.5 Marks)
- c. State four (04) factors which affect the rate of demand of water supply. (2.5 Marks)
- d. The following is the population data of a city available from past census records. Determine the population of the city by 2036 using below mentioned methods,
 - i. Arithmetical increase method
 - ii. Geometrical increase method
 - iii. Incremental increase method

Year	1956	1966	1976	1986	1996	2006	2016
Population	12250	17100	27600	42250	57200	67750	73500

(15 Marks)

2.

- a. What is the primary objective of water treatment and purification? (2.5 Marks)
- b. State five (05) important requirements of water for domestic use. (2.5 Marks)
- c. Briefly explain the following topics.
 - i. Dissolved impurities
 - ii. Colloidal impurities(2.5 Marks)
- d. What is a water intake? (2.5 Marks)
- e. List down four (04) points that should be considered in selecting a suitable site for the intake structure (5 Marks)

Time	Average hourly demand rate (l/min)	Time	Average hourly demand rate (l/min)
12	0	12	19000
1 A.M.	8000	1 P.M.	17500
2	9500	2	16000
3	10500	3	15500
4	11500	4	15500
5	12500	5	16000
6	15500	6	17000
7	17000	7	18500
8	21000	8	18500
9	23000	9	15500
10	22000	10	13000
11	20000	11	11000
		12	9000

(10 Marks)

- f. List down and explain four (4) factors that should be considered when selecting a pump for a particular application. (10 Marks)
- 3.
- List down two (02) advantages and two (02) disadvantages of HDPE pipes. (2.5 Marks)
 - What are the types of valves that can be used to regulate the flow? (2.5 Marks)
 - Briefly explain the importance of having "Air relief valve" in pipelines. (2.5 Marks)
 - How we can judge the performance of a certain distribution system? (2.5 Marks)
 - Briefly explain the purpose of having distribution reservoirs in a distribution system. (5 Marks)
- f. The table shows the hourly demand for the maximum day. Assuming 24 hour pumping at a uniform rate determine followings;
- Uniform pumping rate
 - The storage capacity equalizing reservoir

4.

a. Write short notes on following topics

- i. Rotor of a motor
- ii. Stator of a motor

(5 Marks)

b. Briefly explain the importance of knowing the "Power Factor" in electrical machines

(5 Marks)

c. List down five (05) possible fault conditions that can be seen in electric motors in the industry

(5 Marks)

d. How "Preventive maintenance" is applied in electric motor maintenance.?

(5 Marks)

e. State all the facts that should be considered when to repair the motor instead of repairing it.

(5 Marks)

Important Equations

1. $P_n = P + nI$

2. $P_n = P \left(1 + \frac{I_a}{100}\right)^n$

3. $P_n = P + nI + \frac{n(n+1)}{2}r$

