



Sheet (1) Water Supply-Population Prediction

1- Which of the following factors doesn't affect the population growth?

- Immigration
- Industrial and commercial facilities
- Water quality
- War and diseases

2- Which **two** of the following basic studies aren't needed in water supply projects?

- Present and future population
- Standard of living
- Cost of water
- Design period

3- Which **two** of the following factors don't affect the rate of water consumption in a city?

- Climate condition
- Transportation facilities
- Sewerage facilities
- Design period

4- Which **two** of the following are not preferred water characteristics?

- Clarity
- Low turbidity
- Color
- Hardness

5-The previous census of the city was as follows:

YEAR	POPULATION	YEAR	POPULATION
1920	55000	1960	91000
1930	57000	1970	100000
1940	67000	1980	106000
1950	79000	1990	108000

a- The expected population of this city at year 2020 by using "Arithmetic method" is:

- 229714 capita
- 130714 capita
- 13714 capita
- 22971 capita

b- The expected population of this city at year 2020 by using "Geometric method" is:

- 144218 capita
- 18298 capita
- 144218.6 capita
- 18298.9 capita

c- Anticipate the population at year 2040 using the Graphical extension method.

6- The population data for a city "A" and a similar larger city "B" is tabulated below. It is required to estimate the population growth for the first city (A) in the year 2010 using comparison method.

YEAR	CITY "A"	CITY "B"
1930	66000	95000
1940	73000	105000
1950	85000	118000
1960	95000	130000
1970	105000	140000
1980	118000	160000

7- For a town of population 150000 capita and an average daily water consumption of 200 liters per capita. It is required to:

Draw the characteristics consumption curve.

The consumption per capita through an average day is as follow:

TIME	CONSUMPTION (l/h)
12 AM - 2	1
2 - 4	5
4 - 6	7
6 - 8	11
8 - 10	18
10 -12 PM	21
12 PM - 2	13
2 - 4	10
4 - 6	7
6 - 8	3
8 - 10	3
10 - 12 AM	1

a- The percentages of minimum and maximum consumption through the day to the average value are:

- 20%, 400%

- 24%, 481%

- 12%, 252%

- 5%, 200%

b- The maximum monthly consumption, the maximum daily consumption and the maximum hourly consumption are:

- 300, 360, and 500 l/c/d

- 200, 300, and 500 l/c/d

- 200, 300, and 360 l/c/d

- 200, 360, and 500 l/c/d

c- If the population increased at a rate of 1.8 per year, find the maximum monthly, daily and hourly consumption after 40 years if the increase of water consumption is 10% of the increase of population.

8- A community has an estimated future population of 42000 capita after 20 years. The present population is 30000 capita and the average water consumption is 12000 m³/d. The existing water treatment plant has a design capacity of 15000 m³/d. Assuming an arithmetic rate of population growth, determine in what year the existing plant will need to be extended.

With My Best Wishes