INTERNATIONAL CENTRE FOR APPLIED SCIENCES
MAHE, MANIPAL

B.Sc. (Applied Sciences) in Engg.

End – Semester Theory Examinations – May 2021

IV SEMESTER - WATER SUPPLY ENGINEERING (ICE 243)

(Branch: CIVIL)

Time: 3 Hours **Date: 17 May 2021** **Max. Marks:50**

- ✓ **Answer ALL questions.**
- ✓ **Missing data, if any, may be suitably assumed**

1A. A small town with population 50,000 having daily requirement of 5 ML, it is proposed to construct a distribution reservoir. Pumping is to be done at a constant rate for 8 hours (9AM to 5PM). Work out the storage capacity of the reservoir required. Assume break down reserve as 2 hours supply and fire reserve at one lpcd.
The pattern of draw off is as follows.

4AM to 9AM	35% of daily supply
9AM to 2PM	10% of daily supply
2PM to 5PM	20% of daily supply
5PM to 9PM	25% of daily supply
9PM to 4AM	10% of daily supply

(5)

1B. Explain the following sources of water with respect to their quantity and quality for water supply scheme (i) Streams (ii) Springs (iii) River (iv) Wells **(5)**

2A. Define yield of a well? List the factors affecting the yield of well. Explain any one method to determine the yield of a well. **(5)**

2B. Compare rapid and slow sand filter under following heads.
(i)Rate of filtration (ii) Wash water requirements (iii) Method of cleaning (iv) Effective size of filter sand (v) Size of each filter beds. **(5)**

3A. With chemical equations explain the Lime soda method of softening and give its advantages and disadvantages. **(5)**

3B. Explain (i) Specific yield of well. (ii) Break Point Chlorination (iii) Fire Reserve (iv) Disinfectant (v) Flocculator **(5)**

4A. For the following census data, forecast the population by 2050 using Geometrical increase and Incremental increase method.

Year:	1970	1980	1990	2000	2010	
Population in thousands:	75	90	135	190	255	**(5)**

4B. Give any four objectives of water analysis? Give the permissible limit and harmful effects of following impurities in drinking water. (i) Iron (ii) Nitrates (iii) Fluorides. **(5)**

5A. Explain Free available Chlorine and Combined Chlorine. Determine the chlorine demand of water if the residual desired is 0.2 mg/l when10 kg of bleaching powder with 30% available chlorine is added to 3ML of water. **(5)**

5B. Define (i) Surface over flow rate (ii) Detention time (iii) Contact time (iv) Disinfection (v) Aeration **(5)**

****