Thapar Institute of Engineering and Technology, Patiala
End Semester Examination (1st semester, 2006-07)
3rd year B.E (Civil) CE-010: Water Supply Engineering
Time: 3 hours Marks: 50

146

Note: Attempt any FIVE full Questions.
All the parts of a Question should be together.

1. a) Public water Supply Scheme is significant in the context of present times.— Explain.

b) The population of locality collected from the census Department is as follows.

Year	1880	1890	1900	1910	1920	1930	1940	1950	1960
Population	8000	12000	17000	22500	29000	37500	47000	57000	66500

Estimate the population of the locality in the years 2000, 2020 and 2040 by 'Incremental Increase' method.

c) Distinguish between
i) open well and tubewell
ii) Submerged intake and intake tower (2,4,4)

2. a) Explain the following.
i) No single pipe is considered ideal for conveying water.
ii) More than a mechanism involves in bringing corrosion of water pipes.
iii) Pipes arranged in parallel manages better than pipes in series the water.

b) A pipe of 600 mm. dia and 3000 m length is provided with a valve at its end. water is flowing with a velocity 2 m/s. Assuming the velocity of pressure wave as 1500 m/s, find
i) the rise in pressure if valve is closed in 20 sec.
ii) the rise in pressure if valve is closed in 2.5 sec. Assume the pipe rigid and bulk modulus of 2 GN/m^2.

c) Sketch a Hand Pump, indicating the various components of it. (5,3,2)

3. a) Distinguish between
i) Dead end System and grid iron System
ii) Elevated reservoir and Surface reservoir
iii) Single float air relief valve and double float air relief valve
iv) Leakage of water and wastage of water

Office Copy, CE010.

b) Define House plumbing. What are the various plumbing units related with water at a house? (8,2)

4. a) The method of collection depends on the source of water – Comment.

b) The total hardness obtained from the complete analysis of a water sample is 120 mg/L. The analysis further showed that the concentration of all three principal cations (Ca, Mg, Sr; Mol wt – 40, 24, 88 respectively) causing hardness are numerically the same. If the value of carbonate hardness is 55 mg/L, Calculate
i) Non carbonate hardness ii) concentration of principal cations
iii) Total alkalinity in mg/L.

c) Name five important communicable water borne diseases. What are the fundamental requirements of Potable water? Explain the term turbidity, pH, MPN giving how they affect water Quality and what are their permissible limits as per Indian standards? (2,3,5)

5. a) What are the advantages gained with 'UNITS' approach during water treatment?

b) An ideal sedimentation tank with a surface area 100 m^2 receives an inflow of 25×10^6 L/d. Referring to data given in table below for particles A, B and C, find out what percent of each size would settle down.

Particle	Settling velocity (cm/s)
A	0.49
B	0.25
C	0.20

c) Distinguish between
i) Discrete particle and flocculant particle
ii) Dry feeding and wet feeding of coagulant (2,4,4)

6. Add notes on the following
i) Methods of aeration of water
ii) Comparison of slow sand filter and rapid sand filter
iii) Free chlorine and combined chlorine
iv) Types of fluorosis

($2\frac{1}{2}$ each)

- The most important Duty of a student is to STUDY.