24289

B. Tech 5th Semester

Examination – December, 2011

WATER SUPPLY AND TREATMENT

Paper : CE - 305 - F

Time : Three hours]   [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in total. Question No. **1** is *compulsory* and attempt *one* question from each Section. All questions carry equal marks. Assume value of missing data wheresoever necessary.

1. (a) Answer the following in brief :

   (i)   What is water borne disease ? Name any *two* water borne diseases.

24289-1000-(P-7)(Q-9)(11)   **P. T. O.**

(ii) What is co-agulation ? Name any *two* co-agulants.

(iii) What is the objective of pressure reducing valve and reflux valve in water distribution system ?

(iv) What is the purpose of balancing reservoir in WDS ?

(v) What do you understand by quality and quantity of surface and sub-surface water ?

(b) Complete following statements :

(i) Unaccounted for water should not exceed ....

(ii) Selection of Pipe material is based upon ....

(iii) Uniformily coefficient of filter media in rapid sand filters and slow sand filter is .... and .... rest.

(iv) Minimum residual chlorine at last tap should be ....

(v) Sluice valves are used for ....

$$5 \times 2 + 5 \times 2 = 20$$

SECTION – A

2. (a) Define per capita supply and design period.

(b) Name the factors affecting consumption in cities.

(c) Name at least *five* recommended guidelines for physical, chemical, toxic parameters of drinking water supply as per WHO standards. $4 + 6 + 10 = 20$

3. (a) A city has following recorded population :

1951	50000
1971	110000
1991	160000
2011	198000

24289-1000-(P-7)(Q-9)(11)　　　(3)　　　　　　　P. T. O.

Estimate (a) the saturation population and (b) Expected population in 2031.

(b) Draw typical sketch and plan an Intake to draw water from river Yamuna for supplying water to Wazirabad treatment plant. $10 + 10 = 20$

SECTION – B

4. (a) Describe the design principle of a settling tank.

(b) Design a plain sedimentation tank to treat 5 MLD water, for a detention period of 8 hours. Assume depth of tank as 3.5 metres.

(c) Define super-chlorination ; residual chlorine.
$$8 + 8 + 4 = 20$$

5. (a) What action takes place during filtration ?

(b) Differentiate between the slow sand and rapid sand gravity filters, in tabular form.

24289-1000-(P-7)(Q-9)(11)   (4)

(c) What are the causes of tastes and odours in water available from various sources ? Enumerate any *one* method of their removal. $6 + 8 + 6 = 20$

SECTION – C

6. (a) Describe with the help of neat sketches various types of joints used in C.I. pipes.

(b) What do you understand by corrosion in pipes and what are the remedial measures ?

(c) Tabulate the distinct qualities of CI Pipes AC Pipes, PVC Pipes. $6 + 6 + 8 = 20$

7. (a) What points should be considered in deciding location of pumping station.

(b) How would you find out the most economical size of a rising main.

(c) What pump's type will be recommended for lifting of

(i) Raw water at pumping station upto 15m

(ii) Clear water from sump to 30m upto 15m high building

(iii) Direct pumping from clear water tank into distribution system. $6 + 6 + 8 = 20$

SECTION – D

8. (a) A large service reservoir (overhead) supplies water to two parts of a town :

Part A : Population 80,000

Part B : Population 50,000

Determine the size of supply conducts.

Per capita water supply is 90 litres per capita per day

(b) Describe general methods of distribution of water in a town. $10 + 10 = 20$

9. (a) Write a detailed note on detection and prevention of wastages of water in distribution system.

(b) Explain the basic principles of design of internal distribution pipe system in a building.

(c) Write short notes on : $8 + 6 + 6 = 20$

    (i)   House connection

    (ii)   Storage cistern

    (iii) X-section of two supplier with neat diagrams.

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