Register No: ……..

B.E., DEGREE EXAMINATIONS: NOV/DEC 2012

Fifth Semester

CIVIL ENGINEERING

CEE116: Environmental Engineering –I

Time: Three Hours **Maximum Marks: 100**

Answer All the Questions:-

PART A (10 x 1 = 10 Marks)

1. The economical diameter of a pipe through which a discharge of 0.6 cumes is to be passed is _____
   a. 1.2 m b.0.85m c.0.6m d.0.4m

2. If the pressure increases from 20m head of water to 30m head of water, then the corresponding losses due to leakage is_____
   a. 20% b.30% c.25% d.50%

3. According to Goodrich formula the maximum weekly demand is_____of average daily demand.
   a. 180% b.148% c.128% d.100%

4. _____is an example for aquifuge
   a.Sandy clay b.Claylayer c.Marble rock d.Granite rock

5. The normal maximum discharge of tube well is of the order of _____
   a.20 lts/sec b.50 lts/sec c.90 lts/sec d.200 lts/sec

6. The cast iron water mains are
   a. Durable b.Resit high pressure c.Liable to corrison d.All the above

7. A harmful organism which may present in fecal matter may be
   a.E-coli b.B-coli c.Vibro cholera d.Facultative
8. Particles around 10^{-6} size are best removed by
   a.Filtration b.Plain sedimentation
   c.Coagulation sedimentation d.Aeration
9. Nalgonda technique related to_____ removal from water
   a. Solids removal b.Hardness c.Iron d.Fluoride
10. The elevated tanks without any erected towers for resting the tank body is known as_____
    a.Pressure pipes b.Stand pipes c.Overheads tanks d.Distribution pipes

PART B (2 x 10 = 20)

11. What is meant by the term 'Percapita demand'?How it is estimated?
12. Define the term specific yield and field capacity?
13. Write any four water quality parameters with respect to drinking purpose as per BIS.
14. Estimate the hydraulic gradient in a 2m diameter concrete pipe carrying a discharge of 3cumes.Take manning N=0.013
15. Calculate the settling velocity of the Spherical particle in water whose size is 0.04mm, specific gravity is 2.70 and average temperature of water is 20^0C.
16. What is meant by disinfection in treating public water supply?
17. What do you understand by the term 'Tuberculation' in pipes?
18. What are intake towers? Differentiate dry and wet intake towers.
19. Why good distribution system is required in public water supply system?
20. What are the two hydraulic axioms of equivalent pipe method?

PART C (5 x 14 = 70)

21. a) (i) Estimate the domestic water requirements of a term in the year 2020 by forecasting population by Incremental increase method from the following data. Take the per captia demand as 200 LPCD (8)

Year	1950	1960	1970	1980	1990
Population	2,37,98,624	4,69,78,325	5,47,86,437	6,34,67,823	6,90,77,421

(ii) Why a planned water supply scheme is necessary for a town? (6)

(OR)

b) (i) A water scheme has to be designed for a city having a population of 2,00,000.Estimate the coincident draft when the percapita demand is 250 LPCD.Take maximum daily draft as 180% of average daily draft. (8)

(ii) Compare the intermittent and continuous water supply system (6)

22. a) (i) In a field test, a time of 8 hours was required for a tracer to travel through an aquifer from one well to another. The observation wells are 60m apart and the difference in their water levels was found to be 0.60m.Find the coefficient of permeability (k).If the porosity of soil is 20%. (8)

(ii) What do you mean by well log and development of bore well? State their importance in ground water source. (6)

(OR)

b) (i) During a recuperation test the water level in an open well was depressed by pumping by 4.0 mts and is recuperated by an amount of 2.5mts in one hour. Find the yield from a well of 5m dia under a depression head of 5m.Also determine the diameter of well to yield 15LPS under a depression head of 3.0m. (8)

(ii) What is a canal intake? What are the various factors to be considered for locating an intake structure? (6)

23. a) (i) From a clean water reservoir (RL+27.00m) water is to be pumped to an elevated reservoir (RL+85m) at constant rate of 2MLD. The distance between them is 2500m.Find the economical diameter of the rising main using Lea's formula and BHP of the pump if the efficiency of the pump is 80%.Neglect minor losses and take f=0.02 (8)

(ii) Write a brief note on series and parallel operations of pumps. (6)

(OR)

b) (i) A pump is to deliver water from a UG Tank against a head of 40m. The suction pipe is 50m long and is of 25m diameter with Darcy's friction factor(f)=0.02.The delivery pipe is 20cm dia,1600m long has f=0.022.If the discharge of the pump is $0.1m^3$/sec.Find the total head of the pump. (8)

(ii) List out the various types of pressure pipes based on material and state their advantages in water transmission. (6)

24. a) (i) A circular sedimentation tank is to handle 4MLD of raw water. If the detention time of the tank is 5 hours and the depth of the tank is 3m,Find the diameter of the tank? (8)

(ii) Write a brief note on Jar test and orthotolidine test in water treatment. (6)

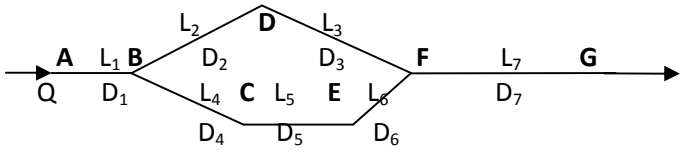
(OR)

b) (i) Design six slow sand filter units (one is stand by) from the following data. (8)

Population to be served – 60,000
Percapita demand -200 LPCD
Rate of filtration - 180L/hr/m^2 of filter area
Lens of each bed - 2 times the breath
Take max demand – 1.8 times of daily demand.

(ii) Write a brief note on "Theory of sedimentation". (6)

25. (a)(i)Find the equivalent pipe length when the equivalent diameter of the pipe is given as 0.45m for the given below pipe network. (8)



L_1= 200m	L_2 = 1000m	L_3=1200m	L_4=800m	L_5=900m	L_6=1000m	L_7=400m
D_1=20cm	D_2=25cm	D_3=15cm	D_4=20cm	D_5=25cm	D_6=30cm	D_7=35cm

(ii) Write a brief note on leak detection and corrosion control in pipe networks. (6)

(OR)

b) (i) Calculate the storage required to supply the demand shown in the following table when pumping is done for 24 hours (8)

Time	4am	8am	12noon	4pm	8pm	Midnight
Cumulative draft in million liters	0.5	1.40	2.60	3.70	4.50	5.00

(ii) Write a brief note on radial pipe layout system of distribution network. (6)

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