CLASS: MTECH/PRE-PHD   SEMESTER : I/NA
BRANCH: ENV   SESSION : MO/18

SUBJECT: CE529 WATER SUPPLY ENGINEERING

TIME: 3 HRS.   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	i. How do you determine the physical quality of water? ii. Relate and analyze the water quality parameters with epidemiology.	[2+3]
Q.1(b)	Write down the CPCB Water Quality Standards.	[5]
Q.2(a)	Draw the logistic curve of population growth and determine the saturation population and expected population after 20 years for a city that has grown from 30000 to 170000 and then to 300000 in two periods of each 20years.	[5]
Q.2(b)	A new township is being planned to develop in Ranchi. Which method of population growth will be suitable and what will be the water demand of the township? Make suitable assumptions.	[5]
Q.3(a)	A tube well fully penetrates a confined aquifer. Determine the diameter of the tube well if the yield required is 100lit/sec, Radius of circle of influence is 200m, thickness of confined aquifer is 30m and draw down id 5m. The coeff of permeability is 60m/day.	[5]
Q.3(b)	i. Using suitable diagrams explain the types of intake structures. ii. What are the advantages and disadvantages of centrifugal and rotatory pumps?	[2+3]
Q.4(a)	i. State the different forms of chlorination. ii. What are the different forms in which chlorine is applied to water for disinfection.	[3+2]
Q.4(b)	The water quality of a township is affected by non carbonate hardness and colloidal impurities. Suggest and the techniques for treatment and justify your judgement.	[5]
Q.5(a)	i. Describe the process of detecting leakages in underground distribution pipes. ii. Write short notes on nano filtration and ultra filtration.	[2+3]
Q.5(b)	Calculate the amount of lime and soda required to treat 2mill lit of hard water containing carbonate hardness equal to 15deg French and magnesium hardness equals to 9deg French and total hardness of 12deg French.	[5]

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