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Total Number of Pages : 02

B.Tech
PCCI4402

7th Semester Back Examination 2018-19
WATER SUPPLY AND SANITARY ENGINEERING

BRANCH : CIVIL

Time : 3 Hours

Max Marks : 70

Q.CODE : E527

Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions : (2 x 10)**
- a) List the various water - borne diseases caused by Bacteria and Virus.
 - b) Distinguish between BOD and COD.
 - c) Differentiate gravity conduit and pressure conduit
 - d) Enumerate the mechanisms of Filtration process.
 - e) What is the significance of over flow rate in sedimentation tank design?
 - f) Distinguish between discrete and flocculent settling.
 - g) What is the significance of F/M ratio in ASP design?
 - h) What is the significance of self-cleansing velocity in sewer design?
 - i) What do you mean by Sewage Sickness?
 - j) Enumerate various methods of sludge dewatering.
- Q2 a) What are 'infiltration galleries' and 'infiltration wells'? Explain both with neat sketches. (5)**
- b) If a water supply scheme to be designed for serving a population of 4 lakhs, the storage reservoir is situated at 8km away from the city and loss of head from the source to the city is 16m. Calculate the size of supply main by using Darcy Weisbach formula as well as by using Hazen's William formula assuming a maximum daily demand of 200 litres per capita per day and half of daily supply to be pumped in 8hrs. Assume coefficient of friction of pipe material as 0.012 in Weisbach formula and CH = 130 in Hazen's formula. (5)**
- Q3 a) How do you compute the power requirements of a pumping unit? (5)**
- b) Discuss with a schematic diagram the design concepts of a horizontal flow sedimentation tank. What is its advantage over a vertical up flow sedimentation tank? (5)**
- Q4 a) In a continuous flow settling tank 3m deep and 60m long, what flow velocity of water would you recommend for effective removal of 0.025 mm particles at 25°C. The specific gravity of particles is 2.65, and kinematic viscosity for water may be taken as 0.01 cm²/sec. (5)**
- b) Calculate average chlorine required per day to treat 120 ML/d of water. Also calculate the storage required for 60 days. Assume an average chlorine demand of 3.8 mg/L. (5)**
- Q5 a) The 4 day 30°C BOD of a sewage is 135 mg/L. Calculate its 2 day 27°C BOD. The deoxygenation constant at 20°C is 0.1. (5)**
- b) A 30 cm diameter sewer having an invert slope of 1 in 150 was flowing full. What would be the velocity of flow and discharge? (n=0.013). Is the velocity self-cleansing? What would be the velocity and discharge when the same is flowing at 0.20 and 0.8 of the full depth (5)**

109	Q6	a) Briefly discuss about the systems of sewerage	109	(5)	109
		b) Discuss the effect of pH and temperature on sludge digestion		(5)	
	Q7	What are the requirements of a good distribution system? Discuss with neat sketches the various types of layout of distribution systems.			(10)
	Q8	Write short answer on any TWO :			(5 x 2)
		a) Operational Troubles in Rapid Gravity Filter			
109		b) Activated sludge process	109	109	109
		c) Ion Exchange resins for Water Softening			
		d) Disposal of sludge			

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