(3 hours)   **Marks : 80**

N.B.

1. Question **No 1 is compulsory**

2. Attempt any three questions from the remaining **five** questions

3. Assume **suitable** data where ever required

4. **Figures** to the **right** indicate **full** marks

Q.1	**Attempt any four**	**(20)**
	a. Write down the permissible limits for following parameters set by BIS and its significance **i)** Residual chlorine **ii)** Turbidity **iii)** hardness **iv)** chlorides **v)** Alkalinity.	
	b. Explain classification of distribution system with neat sketch.	
	c. Give the requirements of good water meter.	
	d. What are the impacts of air pollution on man and environment?	
	e. Compare chlorine and ozone as disinfectant	
Q.2	a. Draw the flow diagram of water treatment process and explain each component in details.	**(10)**
	b. What do you mean by intake structure? Explain any 3 types of it	**(05)**
	c. What are the factors that affecting efficiency of sedimentation?	**(05)**
Q.3	a. Design approximate dimensions of a set of rapid gravity filters for treating water required for a population of 65,000. The rate of supply being 140 lpcd. The filters are rated to work 5000 lit/ hr/m^2. Assume data necessary.	**(05)**
	b. Draw the neat and well labeled sketch of pressure filter.	**(05)**
	c. Explain different methods of disinfection and its suitability	**(10)**
Q.4	a. Explain in detail sources, effects, control methods of noise pollution.	**(10)**
	b. Calculate quantity of bleaching powder required per day for disinfecting 5 MLD. The dose of chlorine has to be 0.7 ppm and bleaching powder contains 30% of available chlorine.	**(10)**
Q.5	a. Classify and discuss the different air pollutants.	**(10)**
	b. Define water softening. Explain Ion-exchange process in detail	**(10)**
Q.6	Write short note on following **(any four)**	**(20)**
	a. Residual chlorine.	
	b. Tube settlers.	
	c. Rapid mixing devices.	
	d. Reverse osmosis.	
	e. Methods of collection of rain water for direct use.	
	f. Occupational hazards due to air pollution.	