



Try in the following questions

Question One **(30 Marks)**

- 1- a) Write a brief notes with using sketches about the following methods of water sedimentation and the difference among each: Plain, With flocculator, Pulsator, Tube-settlers, and Super high rate.
- b) Discuss with using sketches the different types and methods Coagulation process in water treatments.
- c) Design the Tube-Settlers tanks and their inlet, outlet and sludge pipes for a water treatment plant of 280,000 m³/day.
 - **Draw plan and sections** for the designed basin with its structures.

Question Two **(30 Marks)**

- a) Discuss the negative pressure in filtration processes and methods of overcomes.
- b) Design the **pressure filters** and their connecting pipes in a water treatment plant of 75,000 m³/day. **Draw plan and sections** for the designed unites
- c) Explain the theory of using **Ozone** as a disinfectant with its benefit and drawbacks.

Question Three **(20 Marks)**

- a) Discuss with using sketches the difference methods employed in water desalinations.
- b) Explain in details the use of Multi-Stage Flash “MSF” Distillation (thermal evaporation) for sea water desalination (idea, advantage, disadvantages, flow diagrams).

Question Four **(20 Marks)**

- a) Discuss the reason for removing of Hardness, Iron and Manganese in water supply with explaining the main methods for that.
- b) Design and draw a water softening plant of flow 3500 m³/day, raw water hardness 400 mg/l, allowable hardness in treated water 45 mg/l, ion exchange capacity of used resin 10 kg/m³, capacity of regeneration salt 40 kg/m³.

With my best wishes

Prof. M. Elsheikh

This exam measures the following ILOs			
Question No.	Q1-a, Q1-b, Q2-a, Q3-a, Q4-a	Q2-c, Q3-b	Q1-c, Q2-b, Q4-b
Skills	A-3	B-3	C-1
	Knowledge & Understanding	Intellectual Skills	Professional Skills