code. P111-222-1SE-ESE

Total No. of Questions – [6] Total No. of Printed Pages: – [2]

G.R. No.	

May/August 2021 / INSEM+ENDSEM
F. Y. M. TECH. (Civil-WREE) (SEMESTER – I/II)
COURSE NAME: Advanced Water Treatment
COURSE CODE: CVPA11202
(PATTERN 2020)

Time: [3 Hours] **[Max. Marks: 60]**

(*) Instructions to candidates:

1) **All Questions are compulsory**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1)a) Elaborate different methods for removal of fluoride from water. [4]

b) Estimate the unit sizes of cascade aerator for WTP having capacity of 100MLD. [6]

Q.2)Design radial type circular sedimentation tank for the following data. [6] Q= 400 m3/day, water used in de sludging 3%, min. size of alum floc to be removed 1mm, sp. Gravity 1.02, n=1/8. Take viscosity of fluid at 20 ^{0}C. Also write difference between rectangular and circular type sedimentation tank.

b)A settling basin is to be design for overflow rate of 32 m/d. Determine overall efficiency for the particle size distribution as shown in table.**(settling type I)**[4]

Particle size in mm	Wt. fraction grate than % size
0.1	10
0.08	20
0.07	40
0.06	70
0.04	93
0.02	99
0.01	100

Take temp. of water at 20 ^{0}C and sp. Gravity of particle 1.21. Draw graph.

Q.3) a)What is difference between ortho and peri kinetic flocculation [4]

b) Design a flocculator to treat 200 m3/hr water at 20 0C. Assume suitable data. [6]

Q.4) Find the head loss by using **Rose and Carmen Konzey** equation in sand filter for depth of bed 70 cm and particle size distribution table is as follows :

Dia of paticle x10-2 cm	3.54.5	5.5	9.8	11	12.2	13.4	13.8
% wt. fraction	4	9	20	24	20	14	9

Take operating vel. 0.45, shape factor 0.8,e=0.44, kinematic viscosity=0.8x10-2 cm2/sec. [10]

Q.5) a)What are different methods for removal of Iron and manganese from water, explain in detailed. [6]

b) Find osmatic pressure for Nacl having concentration of 1000 mg/l, R=0.082, Temp. 298 K and if pump pressure is 40 atm. What is flux flow rate if permeability rate of water through membrane is 2×10^{-5} gm/cm^2 sec. [4]

Q.6) a) Elobrate SCADA system used in water supply system. [4]

b) What are different methods used for removal of color and odour from water. [6]

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