B-205-40
A-405-23

B.E. VII CBGS
Civil
Env. Engg-II

10.12.15

QP Code : 5976

(REVISED COURSE)

(3 HOURS) [TOTAL MARKS: 80]

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any three questions from remaining five questions.
(3) Assume any suitable data but state the same.
(4) Illustrate answer with sketches wherever necessary.

Q1 (a) State principles governing design of building drainage. (5)
(b) List various control measures of air pollution. (5)
(c) Compare one pipe and two pipe system. (5)
(d) The CO content of an air sample is $90 \mu g/m^3$ at $0^{\circ}C$ and 1 atm. Pressure. Convert it to PPM. Assume necessary data. (5)

Q2 (a) Draw a neat sketch of automatic flushing tank and explain the operation of flushing. (5)
(b) Design imhoff tank for 25000 people and sewage flow 180 lpcd. Assume data . (10)
(c) Explain the biological action and process of sludge digestion (5)

Q3 (a) Why dewatering of sludge is necessary? Explain the method of dewatering the sludge on sludge drying beds. (8)
(b) What are the basic differences between aerobic and anerobic processes (6)
(c) If 5 day 20^0 c BOD of wastewater is 350 mg/l, what will be the it's 7 day, 25^0 C BOD? K_{20} = 0.1 /d. Assume data if required. (6)

Q 4 (a) Draw the flow chart of the municipal sewage treatment plant by using activated Sludge process and trickling filter (10)
(b) Determine the size of high rate tricking filter for the following data: (10)
(i) Sewage flow: 4 MLD (ii) recirculation ratio: 1.5
(iii) BOD5 of raw sewage: 280 mg/l (iv) BOD removal in PST = 25%
(v) Final effluent BOD5 desired = 30 mg/l.

Q 5 (a) Explain in detail with sketch sedimentation tank and its design parameters. (8)
(b) Find the volume of digester for population equivalent -7000, loading rate-0.09 kg/capita/day, volatile solids in raw sludge -70%, moisture content of raw sludge-96%, digestion period -25 days, volatile solids reduction during digestion -50%, moisture content of digested sludge -92%, storage period required for digested sludge -90 days. (6)
(c) What is biological treatment process? Explain aerobic and anaerobic process in detail. (6)

Q 6 (a) Explain intercepting trap in detail. (4)
(b) Explain construction of sewers and steps involved in laying of it. (8)
(c) A 30 cm dia sewer having an invert slope of 1:200 was flowing full. What would be velocity of flow and discharge? (n=0.013). Is the velocity self-cleasing? What would be velocity and discharge, when the same is flowing 0.2 and 0.8 of its full depth? (8)

Proportionate depth (d/D)	Proportionate velocity(v/V)	Proportionate discharge(q/Q)
0.2	0.615	0.088
0.4	0.902	0.3364
0.6	1.072	0.6711
0.8	1.140	0.9781
