Government College of Engineering, Aurangabad

(An autonomous Institute of Government of Maharashtra)

B.E. (Civil) Revised/Old Examination

End Semester Examination **November-December 2016**

CE –441/CE-401 ENVIRONMENTAL ENGINEERING-II

11 NOV 2016

Time: Three Hours | Max. Marks: 60

1. *Attempt any five questions*
2. *All questions carry equal marks*
3. *Assume suitable data if necessary and state it clearly*
4. *Use of non-programmable calculator is allowed*

Q.No.1 *Attempt any three.*

1) Describe design periods for different components of a sewerage scheme.

2) State the reasons for flow variations of sewage. List the types of sewers and state ratio of maximum flow and average flow for these sewers.

3) If the drainage area of suburban area of a town is 36 hectares and maximum rain intensity is 4 cm/hr. The density of population is 225 per hectare and water supply is 200 lpcd. Calculate total runoff and maximum sewage discharge.

4) Explain Shield's expression for self cleansing velocity.

Q.No.2

1) Calculate the size of a circular sewer for a discharge of 580 lps. d/D = 0.4. Assume slope=0.0001 and n = 0.14.

2) Describe the location and spacing of manholes.

3) Write about process microbiology of aerobic process.

Q.No.3

1) Following data is given:

i) Population of town = 150000

ii) Discharge of the stream wherein the sewage of town is discharged = 7.0 m^3/sec

iii) Temperature of the stream and sewage = 20^0 C

iv) BOD of strong sewage = assume suitable value

v) BOD of stream = 1.0 mg/lit

v) Dissolved Oxygen in stream and sewage = 7.0 mg/lit and 0.5 mg/lit respectively

vi) At 20^0 C K'=0.3/day and K_2' = 0.7/day.

Calculate the critical Oxygen deficit and t_c.

2) Write about control of velocity through the grit chamber.

Q.No.4

1) Design a bar screen chamber through which maximum, average and minimum rates of flow are 13 MLD, 9 MLD and 5 MLD respectively.

2) Explain the BOD or COD determination experiment and its importance.

Q.No.5

1) Write about HRT, Volumetric BOD loading, F/M ratio, Sludge age in case of activated sludge process.

2) Draw a sketch of Trickling Filter and explain functioning of the same.

Q.No.6 *Attempt any two*

1) Draw a Partially ventilated single pipe system of plumbing and explain working of the same.

2) Analyse concentration of suspended solids in the mixed liquor for determination of SVI and determination of Q_R/Q in activated sludge process.

3) Write about laying and testing of the sewer pipe line.

Q.No.7 *Attempt any three*

1) Design facultative stabilization pond to treat a domestic sewage flow of 3.5 MLD at a place, the latitude of which is 19^0 North. BOD of sewage is 350 mg/lit.

2) Classify the solid waste. Compare Vermi-composting with Incineration.

3) Write about requisites of sanitary land filling considering Environment (Protection) Act.

4) Distinguish between reverse osmosis and de-ionization process.

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