

FACULTY OF ENGINEERING
B.E. 3/4 (Civil) II – Semester (Main) Examination, June 2014

Subject: Water and Waste Water Engineering

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.
PART – A (25 Marks)

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| 1 | List out various factors affecting population forecasts. | 3 |
| 2 | What is "Design period"? Mention design period for various components in a water supply scheme. | 3 |
| 3 | Write in detail about pressure filters. Mention its merits and demerits. | 3 |
| 4 | Explain the use of Ozone and UV rays for disinfection and list out the disadvantages. | 3 |
| 5 | Estimate the quantity of storm water for an area of 10 hectares using Rational method. | 3 |
| 6 | Discuss self purification process of water bodies like rivers. | 2 |
| 7 | Mention various unit operations in primary treatment of sewage and state their objectives. | 2 |
| 8 | Discuss the role of secondary settling tank in activated sludge process. | 2 |
| 9 | With neat diagram enumerate the functioning of oxidation ponds. | 2 |
| 10 | Explain the functioning of septic tank with a sketch. | 2 |

PART – B (5x10 = 50 Marks)

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| 11 | (a) Name different methods for distribution network analysis. Discuss Hardy-Cross method in detail. | 5 |
| | (b) Estimate the five demands for a town with a population of 20 lakhs by any two methods. | 5 |
| 12 | (a) Draw the cross section of SSF, name different components and discuss the operation of SSF. | 6 |
| | (b) Design a slow sand filter to treat 5 MLD. Also provide sand specification in terms of effective size and uniformity coefficient. | 4 |
| 13 | (a) What are the important parameters to measure the organic content in sewage and explain the significance. | 6 |
| | (b) Determine the BOD ₅ of sewage at 30°C given one day BOD @ 30°C as 130 mg/ℓ. Assume $K_{20} = 0.1 \text{ day}^{-1}$. | 4 |
| 14 | (a) With a neat sketch, explain the basic mechanism of BOD removal in Trickling filter. Mention two modifications in trickling filters with flow-diagrams. | 6 |
| | (b) Design a low rate trickling filter to treat 5 MLD of sewage with a BOD ₅ @ 20°C is 200 mg/ℓ. | 4 |
| 15. | (a) Define municipal solid waste, garbage, refuse and bulk waste. Mention different disposal methods and discuss. | 6 |
| | (b) Discuss the role of secondary settling tank in trickling filter. | 4 |
| 16 | (a) Mention steps in sludge handling and discuss in detail the process in Anaerobic digester. | 5 |
| | (b) Design a septic tank for 300 people. Assume suitable data. | 5 |
| 17 | Write notes on: | 10 |
| | a) Estimation of storm water | b) Break point chlorination |
| | c) Taste and odour control | d) Back wash. |
