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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Eighth Semester, B.E. – Civil Engineering

Semester End Examination; June - 2016

Industrial Wastewater Treatment

Time: 3 hrs

Max. Marks: 100

Note: i) Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.
ii) Draw neat sketches / flow sheets wherever necessary.

PART - A

- 1 a. Illustrate the scope of Industrial wastewater treatment studies in attaining zero pollution. 6
- b. Highlight the various points of that are differentiating domestic wastewater and Industrial wastewater. 6
- c. What is sampling? Comment on importance and types of samples. 8
- 2 a. List various factors that governs self purification of streams and explain any two of them. 6
- b. With the help of neat sketch briefly explain Oxygen-sag curve with the salient points. 6
- c. A city discharges its wastewater into a stream having a saturation D.O = 10.2 mg/L and the following data were observed just after the outfall.
Temperature = 17.5°C, D.O. Concentration = 9.0 mg/L
Ultimate BOD₅ = 30 mg/L at 17.5°C, Recreational constant and Deoxygenation constant 17.5° are 0.4/day and 0.25/day respectively. Determine the time required to reach critical Deficit and the distance in kilometer at which the critical deficit occurs from outfall given the velocity stream is 0.2 m/s. 8
- 3 a. Write brief note on various methods that are adopted to reduce volume of an industrial wastewater. 8
- b. List various steps that can be adopted to reduce the strength of an industrial waste and explain any two of them in detail. 8
- c. What is equalization? Explain the methods of achieving equalization. 4
- 4 a. List various methods adopted for removal of inorganic suspended solids and explain any one of them. 6
- b. Explain briefly the processes involved in treating organic solids. 8
- c. What are colloids? Explain the phenomenal aspects involved in removal of colloidal particles. 6

PART - B

- 5 a. Discuss the pros and cons of combined treatment of different wastewater. 10
- b. Illustrate the different aspects of discharging a raw waste, partially treated and completely treated waste into streams. 10
- 6 a. Comment on the significance of process flow sheets of an industry in planning wastewater treatment facilities. 6
- b. Write a brief note on by-products recovered in distillery wastes. 4
- c. With the help of a flow diagram explain various processes that contribute to waste water generation during vegetable tanning. 10
- 7 a. Discuss the origin and characteristics of the waste water from a dairy industry. 10
- b. How the wastes from the following units of steel plants are treated?
- (i) Coke ovens 10
- (ii) Pickling Bath
- 8 a. Illustrate the simplified flow diagram of a Kraft pulp and paper mill. 10
- b. Draw a flow sheet for a treatment of wastes from a large synthetic drag manufacturing industry. 10

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