

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – WINTER • 2014

Subject Code: 173701**Date: 27-11-2014****Subject Name: Industrial Waste Management****Time: 10:30 am - 01:00 pm****Total Marks: 70****Instructions:**

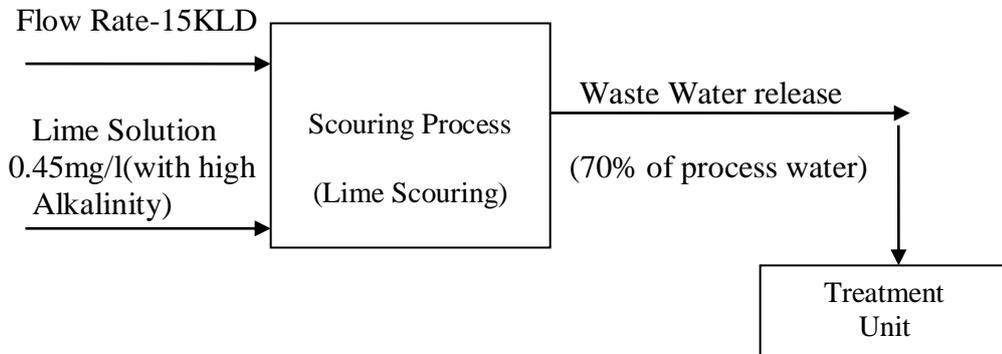
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** A certain district of a city has a projected population of 50,000 residing over an area of 40 hectares. Find the design discharge for a sewer line, for the followings data: **07**
- 1) Rate of water supply=20 liters per capita per day
 - 2) Average impermeability coefficient for entire area=0.3
 - 3) Time of concentration =50 Minutes
- The sewer line is to be discharge for a flow equivalent to the wet weather flow (W.W.F.) plus twice the dry weather flow(D.W.F.) .Use U.S. ministry of health formula. Assume that 75% of water supply reaches in sewer as wastewater
- (b)** Explain the followings facts with suitable technical comments only (Use examples if they have) **07**
- 1) Sustainable manufacturing is widely accepted method by various industries for reducing of cost
 - 2) Raw Materials = Products + Waste Products + Stored Products + Losses (Where losses are unidentified material)
 - 3) Pretreatment require resources input and can be costly
- Q.2 (a)** Apply the concept of integrated management approach in textile industry with a proper flow diagram **07**
- (b)** What are differences of between? (with suitable examples) **07**
- 1) End of pipe approach and cleaner production
 - 2) In-process recycling and On-site recycling
- OR**
- (b)** Sometime neutralization tank is provided /install either before primary treatment or before secondary treatment .Why it is so? State your reason in both of case **07**
- Q.3 (a)** Draw the cooling tower and circulating cooling water system process showing the keywastes generation point and also write the all environment concern issues and their importance. **07**
- (b)** How the supporting activities meant to support the core activity for the proper functioning of industry. Explain it with an example and flow chart as well. **07**
- OR**
- Q.3 (a)** How the process mapping is an important focal point for employee involvement in the EMS(Environment management system).Explain it with an example only **07**
- (b)** List out the all components of steam boiler and explain only those components which are associated with the economical function in steam generation. **07**

- Q.4 (a)** A stream saturated with DO, has a flow of $1.2 \text{ m}^3/\text{s}$, BOD of 4 mg/l and rate constant of 0.3 per day. It receives an effluent discharge of $0.25 \text{ m}^3/\text{s}$ having BOD 20 mg/l , DO 5 mg/l and rate constant 0.13 per day. The average velocity of flow of the stream is 0.18 m/s . Calculate the DO deficit at point 20 km and 40 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5 days. Take saturation DO at 20°C as 9.17 mg/l **07**
- (b)** How the process cost of wine industry can be reduced. Explain it with proper flow chart **07**

OR

- Q.4 (a)**



- 1) Lime is using in scouring process of textile industry with the concentration of 0.45 mg/l (with low alkalinity). 70% of waste water is releasing at the output side. Propose a scheme of treatment for the wastewater
 - 2) How much dose of chemical is required for the treatment?
- (b)** Explain the followings pollution prevention program me and why these programme should be implement in industries **07**
- 1) Raw material modification/substitution
 - 2) Equipment modification
 - 3) Process modification

- Q.5 (a)** Wastewater generated by an industrial unit has been found to have the following composition. **07**

Sr. No	Parameters	Value
1	Flow rate (m^3/hr)	134
2	Peaking factor	2.3
3	pH	11.4
4	Temperature	46°C
5	Oil and grease	160
6	TSS(mg/l)	6000
7	TDS(mg/l)	5500
8	BOD ₅ (mg/l)	5000
9	COD(mg/l)	6470

- 1) Indicate the parameters that require removal/regulation/control through treatment so as the treated effluent can be disposed off into a surface water body?

2) Propose a scheme of treatment for the wastewater in question? Your scheme should also include the facilities for handling the secondary wastes generated. State your reason why you have chosen the units in the specific order or sequence in the scheme?

(b) Draw the schematic arrangement of a simple gas turbine power plant and also list out their environment concern issues and their importance **07**

OR

Q.5 (a) Apply the concept of integrated management approach in diary industry with a proper flow diagram **07**

(b) Explain the followings statements **07**

1) Purposes served by internal treatment of boiler feed water, and chemicals used in the treatment

2) Tanning processes and wastes generated from tanning processes
