Total No. of Questions : 8]

SEAT No. :

P3897

[Total No. of Pages : 2

[5155]- 147
M.E. (WREE)
ENVIRONMENTAL CHEMISTRY & MICROBIOLOGY
(2013 Pattern) (Semester - I) (501082)

Time :3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***Answer any Five questions.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data wherever necessary.***
4) ***Use of electronic pocket calculator is allowed.***

Q1) A 50 m stack height is used for boiler which consume 1000 kg of coal/hr is having 0.8% of sulpher. Calculate average ground level concentration in microgram per gram under following meterological conditions. **[10]**

Stability					Wind speed
ClassB	1Km	4Km	1Km	4Km	-
	141	500	120	510	4m/sec.

Also, determine plume height by using Holland's equation temp. of ambient air is 20ºC, temp. of stack gas is 200ºC, velocity of stack gas 10m/sec, Atmospheric pressure 1000 m Bar.

Q2) Determine solvent requirement for adsorption tower to remove sulpher dioxide gas having discharge 20 cm/sec at 1 atmospheric pressure and 20ºC. sulpher dioxide content 8% by volume. If system in design for 91% removal than equilibrium line of sulpherdioxide & water is x=y/40. Also plot equilibrium line for different values of x & y. **[10]**

Q3) a) A 0.20 kg of air at pressure of 140 KN/m^2 occupies 0.12 cum volume after this conditions air is compressed to 1400 KN/m^2. Air behave pv^1.2 = content. Determine w.D., change in internal energy and entropy. **[6]**

b) Explain basic principle of AAS, its applications. **[4]**

P.T.O.

Q4) a) Determine diameter of cyclone chamber for the following data;viscosity at 20ºC = 1.2×10^{-5} kg/m^{-9}, density of particle = 1200kg/m^3, density of gas = 1Kg/m^3; n=10; w=1m, L=4m, Discharge = 6m^3/sec. **[6]**

b) Explain different methods for removal of TDS. **[4]**

Q5) Find capacity of anaerobic digester; from following data; **[10]**
MCRT = 10 day;8s = 600mg/lit; ss removed in PST = 60%, sp. gravity of sludge = 1.04; concentration of solids in sludge ps = 0.06; Density of water = 1000 Kg/m^3.
Find-

a) Sludge produced due to S.S.removed.
b) Volume of primary sludge.
c) Volume of digester.

Q6) Explain basic principle of Trickling filter, draw neat sketch and its applications with design parameter. **[10]**

Q7) Explain the electro dialysis process and determine power required for electro dialysis process for the following data;
Q = 4000 m^3/day; TDS = 2000 mg/lit; No.of cells = 300 catians and anions concentration = 0.011 Eq/L; salt removed efficiency = 50%; current efficiency = 90%; R = 50 ohm use data sheet if required. **[10]**

Q8) Write basic principle diagram & application with design parameters of the following;

a) Common efficient Treatment plant. **[5]**
b) Activated sludge process (ASP) **[5]**