

**M.Sc. DEGREE I SEMESTER EXAMINATION IN ENVIRONMENTAL TECHNOLOGY  
NOVEMBER 2010**

**ENV/ENB 2108 CHEMOMETRICS AND GOOD LABORATORY PRACTICES**

Time : 3 Hours

Maximum Marks : 50

**PART – A**

(Answer **ANY FOUR** questions)  
(All questions carry **EQUAL** marks)

(4 x 5 = 20)

- I. 1. (a) Find the number of significant figures in the following terms.
- (i)  $6.023 \times 10^{23}$
  - (ii) 0.00602
  - (iii) 6.02300
  - (iv) 6230
- (b) After volumetry a student found the normality of the given solution using the equation  $N_2 = \frac{V_1 \times N_1}{V_2}$ . The volumes  $V_1$  and  $V_2$  were measured with in 0.5% error.  $N_1$  was determined within 1% error. Find the error in reporting  $N_2$ .
- (c) Report the answer in the following calculation in the correct number of significant figures.
- $$\frac{3.1 \times 0.02052 \times 12.51}{12.234} + 26.09.$$
2. What are the precautions to be taken while disposing cyanide solution? Explain.
  3. A 20ml pipette delivered the following volumes. Calculate the Standard deviation. 19.9, 20.2, 20.1, 20.0, 19.8, 19.9.
  4. 10mg of urea ( $m = 60g$ ) is dissolved in 1000 ml water. Express the concentration in molarity and ppm. What is the mole fraction of urea in the solution?
  5. What do you mean by multiple regression models? Explain.

**PART – B**

(Answer **ANY FOUR** questions)  
(All questions carry **EQUAL** marks)

(4 x 3 = 12)

- II
1. Explain buoyancy correction. What is its significance?
  2. You are given 10% (by weight) ammonia solution in water. Express the concentration of ammonia in molality and molarity. ( $M = 17g$ )
  3. 20ml 0.1N NaOH is titrated against 0.1N HCl. Calculate the pH of the solution after addition of 19.9, 20.0 and 20.1ml of HCl.
  4. Explain with one example linear least square method.
  5. What do you mean by Gaussian distribution? Explain with example.

(P.T.O)

**PART – C**  
(Answer ANY NINE questions)  
(All questions carry EQUAL marks)

9 x 2 =18)

- III. 1. Complete the equation with balancing  
 $Fe^{3+} + KMnO_4 + H_2SO_4 \rightarrow Fe^{2+} + \dots\dots\dots$
2. Which of the following is not a primary standard  $NaOH$ ,  $Na_2CO_3$ ,  
 $HCl$ , Oxalic acid.
3.  $\dots\dots\dots$  is used for generating graph in a computer
4. Coefficient of variation =  $\dots\dots\dots$
5. Distinguish between arithmetic and geometric mean.
6. Name an internal standard.
7. A student is measuring absorbance of a solution at different concentration.  
Identify the dependent variable and independent variable.
8.  $\dots\dots\dots$  error cannot be eliminated.
9. The logarithm of a number is  $\bar{3}.3979$ . Find the number.
10. In a 5-digit balance the accuracy is  $\dots\dots\dots$ mg.
11. Write two examples for toxic metals.
12. Population growth is an example of  $\dots\dots\dots$ model.