THE INSTITUTE OF CORPORATE SECRETARIES OF PAKISTAN

C.I.S Examination – January 2011

Business Mathematics and Statistics

Time Allowed: 3 hours **Maximum Marks: 100**

Attempt All Questions.

Q.1: (a) Companies A and B earned profits of Rs. 600,000 and Rs. 1,320,000 respectively during 2009. It is estimated that future annual profit would increase @ 8% and 5% respectively. In which year, the profit of both companies would be equal?

(b) Given that $8x^2 - 2xy - 3y^2 = 0$; **express** 'y' in terms of 'x'.

Q.2: (a) The sum of the ages of a girl and her brother is 26 years. Three years ago her age was 4 times the age of her brother then. Find out the present ages of the girl and her brother.

(b) In a cricket match bye runs were double of the no-balls. The remaining score was greater by six than twelve times the number of bye runs. If the total score was 276, how were the runs obtained?

Q.3: (a) If $y = e^{2x} \div (2x + 1)^{1/2}$; show that : $dy/dx = y^3(4x + 1) \div e^{4x}$

(b) Find out the coordinates of the relative maxima, minima and point of inflexion of the following function: $y = 1/3\ x^3 - 2x^2 + 3x - 9$

Q4: (a) Define the following terms;

a) Statistics
b) Primary Data
c) Variable
d) Discrete Variables
e) Frequency Distributions

(b) Following raw data showing ages in years of 20 childerns studying in a school.

4.9 3.2 4.3 3.5 6.1 5.3 2.6 3.8 3.3 4.6 4.1 4.6 3.6 5.1 3.9 5.8 4.3 4.6 3.2 3.3

a) Construct a frequency table by taking a class interval of one year.
b) Find class boundaries and Mid –values.
c) Find relative frequency distribution.
d) Prepare "less than" and "more than" types of cumulative frequency tables.

Q5: a) define Standard Deviation.

b) Calculate Standard Deviation for the following data;

3, 5, 6, 9 and 7.

Q6: a) Define Arithmetic mean.

b) From the following data prove that "The sum of the deviations of the values from their mean is zero"

22, 17, 27, 14, 22, 18.

Q7: An assembly plant assembles Oven and Fan in addition to its regular production so as to utilize the existing spare capacity prohtably. The assembly is done in two Departments 1 and 2. Department no. 1 has spare capacity of 210 hours and department no. 2 of 150 hours . Each unit of Oven takes 8 hours in department 1 and 3 hours in department 2 while each unit of Fan takes 2 hours each in Department 1 and 2. The profit margins on each Oven and Fan are Rs. 3,000 and Rs. 1,000 repectively. How many units of Oven and Fan should be produced to earn the maximum profit ?

Note: Provide Log and Anti-log tables when demanded.