ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD

(Department of Mathematics & Statistics)

WARNING

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Course: Business Mathematics (1429) **Semester: Autumn, 2012**
Level: B.A, B.Com, BBA **Total Marks: 100**

ASSIGNMENT No. 1

(Units: 1–4)

Note: All questions carry equal marks.

Q. 1 (a) The probability that an allergy patient will be vaccinated is 0.2. If three patients are selected at random what is the probability that,
i) All three will be vaccinated.
ii) Only one will be vaccinated.

(b) Describe different kinds of random variables.

Q. 2 (a) Prove that if E_1 and E_2 are mutually exclusive events then $P(E_1 \cup E_2) = P(E_1) + P(E_2)$.

(b) From the given data calculate mean, median, standard deviation & mode. {8, 10, 9, 8, 12, 18, 15, 11}.

Q. 3 (a) Solve the following quadratic equation by different methods $x^2 - 3x - 18 = 0$.

(b) Draw the graph of the following linear equation $x + 3y = 6$.
Find its x-intercept and y-intercept.

Q. 4 Let C=Celsius degree and F=Fahrenheit temperature degree scales for temperature where $F = \frac{9}{5}C + 20$. Find

(a) The equation for ***C*** and change 200 F into Celsius.
(b) The F -intercept of given equation.

Q. 5 (a) Write the following equation in slope-intercept form

$2x - 7y = -21$ and find its slope.

(b) Find the equation of a line passing through the point (1, 2) and parallel to the line $x + y = 1$.

ASSIGNMENT No. 2

(Units: 5–9) **Total Marks: 100**

Note: All questions carry equal marks.

Q. 1 (a) Describe the rules for multiplication of matrices with the help of examples.

(b) Solve the following system of equations by Crammer's Rule.

$$x_1 + x_2 + x_3 = 2$$
$$3x_1 - 4x_2 + 2x_3 = 17$$
$$3x_1 + 2x_2 + x_3 = 2$$

Q. 2 The technology matrix for a three industry input-output model is

$$A = \begin{pmatrix} 0.5 & 0 & 0.2 \\ 0.2 & 0.8 & 0.12 \\ 1 & 0.4 & 0 \end{pmatrix}$$

If the non-industry demand for the output of these industries is $d_1 = \$4$ millions, $d_2 = \$6$ millions and $d_3 = \$3$ millions.

(a) Determine the equilibrium output level for the three industries.

(b) Determine the inter industry demands for the three industries.

Q. 3 (a) For the function $f(x) = x^4 - 2x^2 + 3$

Determine its derivative and also the points at which $f(x)$ has zero slope.

(b) A body is falling from a height of 100 m and its position at any time t is described by $h(t) = 100 - 16t^2$ where ***t*** is time measured in seconds.

Calculate the velocity and acceleration of the falling body at t = 2sec.

Q. 4 (a) Define revenue and cost applications with examples.

(b) The cost function for producing ***x*** units of motorcycles is given by

C= 50,000 + 5,000x + $0.5x^2$

How many motorcycles should be prepared by the company to minimize the average cost per unit.

Q. 5 (a) Examine the following function for Critical points and determine their nature

$f(x) = \frac{1}{4}x^4 - \frac{9}{2}x^2 + 1$

(b) Explain partial derivatives and find f_{xx}, f_{xy} and f_{yx} for the function

$f(x,y) = 3x^2 + 4xy + 8x + 2y^2 + 5.$