ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Mathematics & Statistics)

Course: Mathematics for Computing-I (3401) **Semester: Autumn, 2012**
Level: BS (CS) **Total Marks: 100**
Pass Marks: 50

ASSIGNMENT No. 1
(Units: 1–3)

Note: All questions carry equal marks.

Q. 1 (a) Solve the inequality and represent the solution on a coordinate line $\frac{3x+1}{x-2} < 1$.

(b) Draw the graph of the equation $4x + 3y + 12 = 0$ and also find x and y intercepts.

Q. 2 (a) Write down distance formula and find distance from the point (3,-2) to line y=4.

(b) Find the domain and range of the given function $f(x) = \frac{1}{1-\sqrt{x}}$.

Q. 3 (a) For the function $f(x) = \frac{1}{1+x}$ and $g(x) = x^2$ find $(f_0 g)\,(x)$ and $(f_0 f)\,(x)$.

(b) Find the following limits

   (i) $\lim_{x \to \infty} \frac{\sqrt{5x^2 - 2}}{x+3}$

   (ii) $\lim_{x \to 0} \frac{x}{|x|}$

Q. 4 (a) Define continuous functions and check the function $f(x) = |x|$ for continuity.

(b) Make a table for the important rules of differentiation.

Q. 5 (a) Given that $F(x) = f(x).g(x)$ where $f(x) = 4x + 1$ and $g(x) = \frac{1}{x^2 - 5}$. Find the points where $F'(x) = 0$.

(b) What is implicit differentiation? Evaluate $\frac{dy}{dx}$ where $x^3 - y^3 = 6xy$.

ASSIGNMENT No. 2
(Units: 4–7)

Total Marks: 100   **Pass Marks: 50**

Note: All questions carry equal marks.

Q. 1 (a) For the function $f(x) = x^4 - 8x^2 + 16$ find the interval on which $f(x)$ is increasing or decreasing, concave up or concave down and inflection points.

   (b) Locate the critical points for the function $f(x) = 2x^3 - 6x + 7$

Q. 2 (a) Approximate the real solution by Newton's method $x^3 - x + 3 = 0$

   (b) Find all the values of c by verifying Mean Value Theorem for the function, $f(x) = x^2 + x, \quad [-4,6]$

Q. 3 (a) Evaluate the integral $\int_0^2 \sqrt{4 - x^2}\,dx$

   (b) Solve the following trigonometric integral $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \sin\theta\cos\theta\,d\theta$

Q. 4 (a) Find the area enclosed by the curves $y = x^3, \ y = -x \ and \ y = 8$

   (b) Find the volume of the solid generated when the region enclosed by $y = x, y = 2$ and $y - axis$ is revolved about the $y - axis$.

Q. 5 (a) Find $\frac{dy}{dx}$ when   (i) $y = \cos(\ln x)$ (ii) $y = \frac{\ln x}{1 + \ln x}$

   (b) For the function $f(x) = 1 + \frac{1}{x}$ find $f^{-1}(x)$ and identity the domain and rang for inverse function.

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