BBA / Integrated (MBA) 1st Semester Examination
June – July 2013
FUNDAMENTAL OF MATHEMATICS
Subject Code: AHL-109

Time Allowed: 03 hours.                Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Attempt any five questions and all questions carry equal marks.

Section – A

1. (a) Prove that: \((A \cup B)' = A' \cap B'\) \[10\]

(b) If \(A = \{2,3\}, B = \{6,8\}, C = \{1,2\}, D = \{6,9\}\), then verify that \((A \times B) \cap (C \times D) = (A \cap C) \times (B \cap D)\) \[10\]

2. (a) If \(A = \begin{bmatrix} 3 & 9 & 0 \\ 1 & 8 & -2 \\ 7 & 5 & 4 \end{bmatrix}, B = \begin{bmatrix} 4 & 0 & 2 \\ 7 & 1 & 4 \\ 2 & 2 & 6 \end{bmatrix}\), verify that \(2(A+B) = 2A + 2B\) \[10\]

(b) Write all the minors and co-factors of the following determinant:
\[
\begin{vmatrix}
4 & 3 & 1 \\
1 & 3 & 2 \\
2 & 1 & 5 \\
\end{vmatrix}
\] \[10\]

3. (a) Find \(\frac{dy}{dx}\), if \(xy - x^3 + y^2 = 0\) \[8\]

(b) Find the points of local maximum and local minimum of the following function:
\[f(x) = x^3 - 6x^2 + 9x + 7\] \[12\]

Section – B

4. (a) In how many ways can 7 Indians and 6 Pakistanis can sit at a round table so that no two Pakistanis are together? \[10\]

(b) Use binomial theorem to evaluate: \((2.2)^5\) \[10\]

5. (a) Find the sum of the following series: \(8 + 3 - 2 - 7 \ldots (-87)\). \[6\]

(b) Find the sum of the following series: \[8\]

\[2^2 + 4^2 + 6^2 + \ldots \ldots \ldots \text{100 terms}\]

(c) Find the sum of the following series: \[6\]

\[5 + 55 + 555 + \ldots \ldots \ldots \text{to n terms.}\]

6. (a) Evaluate the following integral:
\[I = \int \frac{dx}{x(x^6+1)}\] \[10\]

(b) Evaluate the following integral:
\[I = \int \frac{x^3 + 3x^2 + 4}{\sqrt{x}} \, dx\] \[10\]