UNIVERSITY OF NORTH BENGAL

BBA Honours 2nd Semester Examination, 2020

CC3-BBA (202)

BUSINESS MATHEMATICS

Full Marks: 60

ASSIGNMENT

The figures in the margin indicate full marks.
All symbols are of usual significance.

Answer any *two* assignments from three assignments given below

ASSIGNMENT-1

(a) If $f(x) = \dfrac{ax+b}{bx+a}$, then prove that $f(x)f\left(\dfrac{1}{x}\right) = 1$. 　　5

(b) $\begin{pmatrix} 2 & -3 & 1 \\ 0 & 4 & 5 \\ -2 & 7 & -1 \end{pmatrix} \times \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} = ?$ 　　5

(c) Using matrix method solve: 　　7

$$x + y + z = 6$$
$$x - y + z = 2$$
$$2x + y - z = 1$$

(d) What do you mean by $\lim\limits_{x \to a} f(x) = l$? 　　3

(e) Find $\dfrac{dy}{dx}$ when $y = x^x$. 　　5

(f) Show that the maximum value of $x + \dfrac{1}{x}$ is less than its minimum value. 　　5

ASSIGNMENT-2

(a) If $y = f(x) = \dfrac{ax+b}{cx-a}$, prove that $f(y) = x$. 　　5

(b) If $A = \begin{pmatrix} 4 & 2 \\ -1 & 1 \end{pmatrix}$ and I be the 2×2 unit matrix then prove that $(A - 2I)(A - 3I) = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$. 　　5

(c) If $A = \begin{pmatrix} 1 & 8 \\ 0 & -5 \end{pmatrix}$, $B = \begin{pmatrix} -2 & 4 \\ 1 & 3 \end{pmatrix}$, verify $(AB)^T = B^T A^T$. 　　5

(d) Find $\dfrac{dy}{dx}$ when from $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$.   5

(e) The cost function of a product is $C = \dfrac{1}{3}x^3 - 8x^2 + 15x + 6$ find marginal cost.   5

(f) Show that $f(x) = x^3 - 3x^2 + 6x + 3$ has neither maximum nor minimum value.   5

ASSIGNMENT-3

(a) If $f(x) = x^2 + 1$. Is the function continuous at $x = 2$?   5

(b) Differentiate the function w.r.t. x: if $y = e^{5\log x + 2x}$.   6

(c) Evaluate $\lim\limits_{x \to 3} f(x)$ when $f(x) = 2x + 3,\ x > 3$ 5

$$= 3x + 1,\ \ x \le 3$$

(d) Find $\dfrac{d^2 y}{dx^2}$ when $y = x.5^x$.   7

(e) Find the extreme values of the function $y = x^3 e^{-x}$.   7

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