

BCA (Sem-2nd)

BSBC-202 : MATH - II

May-2014

Time : 3 Hours

Maximum Marks : 60

Instructions to candidates : 1) *Section-A is compulsory.*2) *Attempt any **Four** questions form Section-B***SECTION-A**

10x2=20

Q.1 (a) Find value of x such that

$$[1 \ 1 \ x] \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = [0]$$

(b) If $A = \begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 8 \\ 7 & 9 \end{bmatrix}$, find $\text{adg. } (A B)$ (c) If $A = \begin{bmatrix} 4 & 2 & 3 \\ 8 & 5 & 2 \\ 15 & -4 & 5 \end{bmatrix}$, find rank of A.

(d) Find the mean deviation about the mean for the data :- 6, 7, 10, 12, 13, 4, 8, 12

(e) What is the compound interest on Rs. 2000 for two years, at 5% per annum for the first year and at 10% interest for the 2nd year?

(f) Differentiate $\frac{x^2+3x+2}{\sqrt{x}}$ w.r.t. x(g) Differentiate $\frac{x^2+e^x}{\log x+20}$ w.r.t. x(h) Find the minimum value of $f(x) = (2x-1)^2 + 3$, for all $x \in \mathbb{R}$.(i) Find $\int \frac{dx}{\sqrt{x+x}}$ (j) Evaluate $\int \frac{x-1}{\sqrt{x^2-1}} dx$ **SECTION - B****Q.2** (a)

If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ prove that $A^2 - 4A - 5I = 0$ Hence obtain A^{-1}

4x10=40

- (b) Solve, by matrix method, the following equations :-

$$3x + y + 2z = 3$$

$$2x - 3y - z = -3$$

$$x + 2y + z = 4$$

- Q.3** (a) Solve the system of equations by Cramer's

Rule :- $2x + y - z = 5$

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

$$3x - 2y + 3z = -3$$

- (b) Find the values of x such that the rank

of matrix $\begin{bmatrix} 3x-8 & 3 & 3 \\ 3 & 3x-8 & 3 \\ 3 & 3 & 3x-8 \end{bmatrix}$ is less than or equal to 2. Also find the rank for

these values of x .

- Q.4** (a) The mean and standard deviation of 100 observation were calculated as 40 and 5.1, respectively by a student who took by mistake 50 instead of 40 for one observation. What are the correct mean and standard deviation?

- (b) Calculate the mean and standard deviation for the following distribution :-

Class	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	3	7	12	15	8	3	2

- Q.5** (a) Differentiate $\log(x + \sqrt{a^2 + x^2})$ w.r.t. x

- (b) If $x^{13}y^7 = (x+y)^{20}$, prove that $x \frac{dy}{dx} = y$.

- Q.6** (a) Evaluate $\int \frac{dx}{x^3 + x^2 + x + 1}$

- (b) Evaluate $\int \frac{\cos(x+a)}{\sin(x+b)} dx$

- Q.7** (a) Prove that $\int_{-a}^a \sqrt{\frac{a-x}{a+x}} dx = a\pi$

- (b) Evaluate $\int_0^6 \frac{dx}{a-x^2}$, using Trapezoidal Rule.

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