

Bachelor of Computer Applications (BCA)

Re-appear, Examination

Dec, 2024

ENMA103- Basics of Mathematics

Time: 2.5 Hours

Maximum Marks: 50

Instructions:

- 1) Question No. 1 under Section-A is compulsory.
- 2) Attempt any four from Q. No. 2 to Q. No. 6 under Section-B
- 3) Attempt any two from Q. No. 7 to Q. No.9 under Section-C

Section-A (Compulsory)

1. (a) Fill in the blanks with appropriate answers:

3[CO-1,2,3][L-5]

- (i) If $A = \begin{bmatrix} 2 & 5 \\ 7 & 9 \end{bmatrix}$ and $B = \begin{bmatrix} 11 & 6 \\ 2 & 0 \end{bmatrix}$ then the value $A+B$ is _____.
- (ii) If $y = 5x^5$, then $\frac{dy}{dx}$ is _____.
- (iii) Arithmetic mean of 3 and 27 is _____.

1. (b) Solve the followings:

4[CO-1,3,4] [L-4]

- (i) Find the sum of first 9 terms of A.P.: 7, 12, 17, 22, ...
- (ii) Calculate $\int \frac{5}{x^{3/2}} dx$
- (iii) Compute the following integral $\int (6x^5 + \sin x) dx$
- (iv) Find $\frac{dx}{dy}$ if $y = e^{1-x}$

1. (c) Match the items given in Column-A with those in Column-B:

3[CO-1,2,3] [L-4]

Column-A

Column-B

- (i) $\frac{d}{dx}(10^x)$ (a) 3
- (ii) $A = \begin{bmatrix} 5 & 2 \\ 5 & 4 \end{bmatrix}$, then $A \vee I$ is (b) 0
- (iii) Series $3+9+27+81$, has common ratio r is (c) 10

Section-B

2. (a) Calculate the seventh term of a G.P. with first term 7 and common ratio 3.
 (b) Insert 3 arithmetic means between 7 and 19. 5[CO-2] [L-6]
3. Integrate the following functions : 5[CO-4] [L-3]
 (a) $\int \sqrt{x}(x+3)dx$
 (b) $\int \frac{x^5}{1+x^6}dx$
4. Find the inverse of matrix $A = \begin{bmatrix} 1 & 3 & -2 \\ 3 & -1 & 4 \\ 2 & 1 & -2 \end{bmatrix}$. 5[CO-1] [L-3]
5. (a) Explain chain rule. Hence or otherwise find $\frac{dy}{dx}$, where $y=u^5$ and $u=5x^5+6x^2+x+12$.
 (b) If $y = \frac{2x+1}{x-1}$, find $\frac{dy}{dx}$. 5[CO-3] [L-3]
6. (a) Find the sum of series $1+3+9+27+\dots$ to 10 terms. 5[CO-2] [L-3]
 (b) Find the G.P whose 4th term is 8 and 7th term is 64.

Section-C

7. Evaluate the following integrals using integration by parts. 10[CO-4][L-5]
 (a) $\int x a^x dx$
 (b) $\int x^2 \log x dx$
8. (a) Find $\frac{dy}{dx}$ when $y=x^x$.
 (b) If $y = \frac{2x^3 - x^2 + 12}{2x^2 + 1}$, find $\frac{dy}{dx}$. 10[CO-3]
 [L-4]
9. Solve the following system of equations by Cramer's Rule

$$\begin{aligned} x + 2y - 3z &= 6 \\ 3x + 2y - 2z &= 3 \end{aligned}$$

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

10[CO-1] [L-5]