



**Term Evaluation (Odd) Semester Examination November 2025**

Roll no.....

Name of the Course: B. Com (H)

Semester: I

Name of the Paper: Business Mathematics

Paper Code: BCH 106

Time: 1.5 Hours

**Maximum Marks: 50**

Note:

- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

Q1.

(CO1)

a. Explain with Examples

(i) Square Matrix

(ii) Diagonal Matrix

(iii) Skew Symmetric Matrix

(iv) Symmetric Matrix

OR

b. Solve the system of linear equations,

$$\begin{aligned}x + 3y + 4z &= 8 \\2x + y + 2z &= 5 \\5x + y + z &= 7\end{aligned}$$

Q2.

(CO1)

a. Show that,

$$\begin{bmatrix} 1 & 1 & 2 \\ a & b & c \\ a^2 & b^2 & c^2 \end{bmatrix} = (a - b)(b - c)(c - a)$$

OR

b. Let,  $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ . Then prove that  $A^2 - 4A - 5I = 0$ .

Q3.

(CO1)

a. Find the adjoint of the matrix,  $A = \begin{bmatrix} 1 & 4 & 0 \\ -1 & 2 & 2 \\ 0 & 0 & 2 \end{bmatrix}$ , hence obtain  $A^{-1}$ .

OR

b. Find  $\frac{dy}{dx}$ .

(i)  $x = a \cos t, y = a \sin t$ ,

(ii)  $x^2 \sin x$

(iii)  $\log(\sin 2x)$



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Q4.

(CO2)

- a. Find the derivative of the following functions.  
(i)  $e^{2x} + \sin 2x + x^4$   
(ii)  $x^7 + 6x^2 + \log x$   
(iii)  $(\cos x)^2$   
(iv)  $\log \sin x$

OR

- b. Show that the function  $x^5 - 5x^4 + 5x^3 - 10$  is Maximum at  $x = 1$  and Minimum at  $x = 3$  and neither Maximum nor Minimum at  $x = 0$ , and find the maximum and minimum value of the function.

Q5.

(CO2)

- a. If  $A = \begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} a & b \\ 3 & 5 \end{bmatrix}$ , find  $a$  and  $b$  such that  $AB = BA$ . Compute  $3A + 5B$ .

OR

- b. Find the domain and range of a function:

$$f(x) = \begin{cases} x^2 & x < 0 \\ x & 0 \leq x \leq 1 \\ 1/x & x > 1 \end{cases}$$

Also find  $f(0)$ ,  $f\left(\frac{5}{2}\right)$ ,  $f\left(\frac{7}{2}\right)$ ,  $f(25)$ .