

Reg.No : .....

Name : .....

**MAHATMA GANDHI UNIVERSITY, KOTTAYAM**  
**MGU-UGP (HONOURS) REGULAR EXAMINATION MARCH 2025**  
**NA SEMESTER**  
**Multi-Disciplinary Courses (MDC) - MG2MDCMAT100 - APPLICABLE**  
**MATHEMATICS**  
 (2024 ADMISSION ONWARDS)

Duration: 1.25 Hours

Maximum Marks: 50

*Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I)  
and Appreciation(Ap)*

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

**Part A**

Multiple type Questions

Answer any **25** questionsEach question carries **2** marks

1. Find  $3A$  if  $A = \begin{bmatrix} 3 & 1 & 2 \\ 6 & -1 & 8 \end{bmatrix}$  [A] / [CO1]

a).  $\begin{bmatrix} 9 & 3 & 6 \\ 8 & -3 & 24 \end{bmatrix}$

b).  $\begin{bmatrix} 9 & 3 & 6 \\ 18 & -3 & 24 \end{bmatrix}$

c).  $\begin{bmatrix} 9 & 3 & 6 \\ 18 & 3 & 24 \end{bmatrix}$

d).  $\begin{bmatrix} 9 & 3 & 4 \\ 18 & -3 & 24 \end{bmatrix}$

2. If A is a matrix of order  $3 \times 5$  then each column has [U] / [CO1]

a). 3 Elements

b). 5 Elements

c). 8 Elements

d). 2 Elements

3. If  $P = \begin{bmatrix} 4 & 5 & 2 \\ 1 & 2 & 3 \end{bmatrix}$  and  $Q = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ , which of the following statements is correct? [U] / [CO1]

- a). Both PQ and QP are defined.      b). Neither PQ nor QP is defined.  
 c). PQ is defined, but QP is not defined.      d). QP is defined, but PQ is not defined.

4. If  $A = \begin{bmatrix} 1 & 2 & 2 \\ 3 & 4 & 1 \end{bmatrix}$  Then the order of  $A'$  is [U] / [CO1]

- a).  $2 \times 3$       b).  $3 \times 2$   
 c).  $2 \times 2$       d).  $3 \times 3$

5. If  $A = \begin{bmatrix} 1 & 0 & 2 \\ -1 & 3 & 4 \\ 5 & -2 & 0 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & -1 & 2 \\ 2 & -3 & 6 \\ -2 & 1 & 3 \end{bmatrix}$ , then  $A - B =$  [A] / [CO1]

- a).  $\begin{bmatrix} 0 & -1 & 0 \\ -3 & 0 & -2 \\ 3 & -3 & -3 \end{bmatrix}$       b).  $\begin{bmatrix} 0 & 1 & 0 \\ -3 & 6 & -2 \\ 7 & -3 & -3 \end{bmatrix}$   
 c).  $\begin{bmatrix} 0 & 1 & 0 \\ -3 & 0 & -2 \\ 3 & -1 & -3 \end{bmatrix}$       d).  $\begin{bmatrix} 2 & 1 & 0 \\ -3 & 0 & 2 \\ 7 & -1 & -3 \end{bmatrix}$

6. Which of the following is an example of a scalar matrix? [U] / [CO1]

- a).  $\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$       b).  $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$   
 c).  $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$       d).  $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

7. Find  $A + B$  if  $A = \begin{bmatrix} 5 & 5 \\ 5 & 5 \end{bmatrix}$  and  $B = \begin{bmatrix} 9 & 9 \\ 8 & 7 \end{bmatrix}$ . [A] / [CO1]

- a).  $\begin{bmatrix} 13 & 13 \\ 13 & 12 \end{bmatrix}$       b).  $\begin{bmatrix} 14 & 14 \\ 11 & 12 \end{bmatrix}$   
 c).  $\begin{bmatrix} 14 & 14 \\ 13 & 11 \end{bmatrix}$       d).  $\begin{bmatrix} 14 & 14 \\ 13 & 12 \end{bmatrix}$

8. The matrix  $A = \begin{bmatrix} 0 & 1 & -1 \\ -1 & 0 & 1 \\ 1 & -1 & 0 \end{bmatrix}$  is \_\_\_\_\_ [U] / [CO1]

- a). Scalar matrix      b). Unit Matrix



- c).  $8 \times 8$  d). 8
17. The value of  $\frac{n!(n-1)!}{(n+1)!}$  is [U] / [CO3]
- a).  $n(n-1)!$  b).  $(n!)^2$
- c).  $(n+1)!$  d).  $\frac{(n-1)!}{n+1}$
18. Find the number of words formed with the letters of the word 'DELHI' which begins with D ? [A] / [CO3]
- a). 34 b). 24
- c). 44 d). 22
19. The number of triangles formed by joining the vertices of a polygon of m sides is [A] / [CO3]
- a).  $\frac{m(m-1)(m-2)}{2}$  b).  $\frac{m(m-1)(m-2)}{6}$
- c).  $\frac{m(m-1)(m-2)}{3}$  d). None of these
20. The value of  $\frac{7!}{2!}$  is [A] / [CO3]
- a). 2522 b). 2526
- c). 2524 d). 2520
21. Total number of selections of zero or more things from n identical things is [U] / [CO3]
- a).  $n + 1$  b). 1
- c). 0 d). n
22. Evaluate  $\frac{10!}{8!2!}$  [U] / [CO3]
- a). 45 b). 90
- c). 60 d). 75
23. Find  $\frac{dy}{dx}$  if  $y = x \cos x$ . [A] / [CO4]
- a).  $x \sin x + x \cos x$  b).  $\sin x + \cos x$
- c).  $-x \sin x + \cos x$  d). None of these





Reg.No : .....

Name : .....

**MAHATMA GANDHI UNIVERSITY, KOTTAYAM**  
**MGU-UGP (HONOURS) REGULAR EXAMINATION MARCH 2025**  
**NA SEMESTER**  
**Multi-Disciplinary Courses (MDC) - MG2MDCMAT100 - APPLICABLE**  
**MATHEMATICS**  
(2024 ADMISSION ONWARDS)

Duration: 1.25 Hours

Maximum Marks: 50

**Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I)  
and Appreciation(Ap)**

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

**Part A**

Multiple type Questions

Answer any **25** questionsEach question carries **2** marks

1. Which of the following is an example of a scalar matrix? [U] / [CO1]

a).  $\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$

b).  $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$

c).  $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$

d).  $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

2. If  $P = \begin{bmatrix} 4 & 5 & 2 \\ 1 & 2 & 3 \end{bmatrix}$  and  $Q = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ , which of the following [U] / [CO1]

statements is correct?

a). Both PQ and QP are defined.      b). Neither PQ nor QP is defined.

c). PQ is defined, but QP is not defined.      d). QP is defined, but PQ is not defined.

3. If  $f$  and  $g$  are differentiable at  $x$ , then  $\frac{d}{dx}(f(x) + g(x)) =$  [K] / [CO4]
- a).  $\frac{d}{dx}(f(x)) + \frac{d}{dx}(g(x))$       b).  $\frac{d}{dx}(f(x)) - \frac{d}{dx}(g(x))$
- c).  $\frac{d}{dx}(f(x))\frac{d}{dx}(g(x))$       d). 0
4. The matrix  $A = \begin{bmatrix} 0 & 1 & -1 \\ -1 & 0 & 1 \\ 1 & -1 & 0 \end{bmatrix}$  is \_\_\_\_\_ [U] / [CO1]
- a). Scalar matrix      b). Unit Matrix
- c). Symmetric Matrix      d). Skew-symmetric matrix
5. Find derivative of  $x(2 - x)$  [U] / [CO4]
- a). 2      b).  $2 - 2x$
- c).  $2x$       d).  $x$
6. What is the degree of the polynomial  $3x + 2x^3 + 4 + x^2$  [U] / [CO2]
- a). 1      b). 2
- c). 3      d). 4
7. Find the derivative of  $f(x)$  at  $x = 0$  where  $f(x) = (x^2 - 2)^2$  [A] / [CO4]
- a). 0      b). -2
- c). 1      d). -1
8. Find the value of  $\sin 3x + \cos 3x$  at  $x = 0$ . [U] / [CO4]
- a). 2      b). 0
- c).  $3x$       d). 3
9. The number of triangles formed by joining the vertices of a polygon of  $m$  sides is [A] / [CO3]
- a).  $\frac{m(m-1)(m-2)}{2}$       b).  $\frac{m(m-1)(m-2)}{6}$
- c).  $\frac{m(m-1)(m-2)}{3}$       d). None of these
10. How many 8 letter words can be formed with the letters used in EQUATION when any letter may be repeated any number of times? [A] / [CO3]





25. If  $A = \begin{bmatrix} 1 & 0 & 2 \\ -1 & 3 & 4 \\ 5 & -2 & 0 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & -1 & 2 \\ 2 & -3 & 6 \\ -2 & 1 & 3 \end{bmatrix}$ , then  $A - B =$  [A] / [CO1]

a).  $\begin{bmatrix} 0 & -1 & 0 \\ -3 & 0 & -2 \\ 3 & -3 & -3 \end{bmatrix}$

b).  $\begin{bmatrix} 0 & 1 & 0 \\ -3 & 6 & -2 \\ 7 & -3 & -3 \end{bmatrix}$

c).  $\begin{bmatrix} 0 & 1 & 0 \\ -3 & 0 & -2 \\ 3 & -1 & -3 \end{bmatrix}$

d).  $\begin{bmatrix} 2 & 1 & 0 \\ -3 & 0 & 2 \\ 7 & -1 & -3 \end{bmatrix}$

26. Find the number of words formed with the letters of the word 'DELHI' which begins with D ? [A] / [CO3]

a). 34

b). 24

c). 44

d). 22

27. What is the derivative of  $y = \tan(4x^2)$ ? [U] / [CO4]

a).  $\sec^2(4x^2)$

b).  $8x \sec^2(4x^2)$

c).  $8x \tan(4x^2)$

d). 0

28. Evaluate  $\frac{10!}{8!2!}$  [U] / [CO3]

a). 45

b). 90

c). 60

d). 75

29. The value of  $\frac{n!(n-1)!}{(n+1)!}$  is [U] / [CO3]

a).  $n(n-1)!$

b).  $(n!)^2$

c).  $(n+1)!$

d).  $\frac{(n-1)!}{n+1}$

30. In how many ways can 12 different books be divided equally among 4 sets or groups? [A] / [CO3]

a).  ${}^{12}C_4$

b).  $\frac{{}^{12}C_3 \times {}^9C_3 \times {}^6C_3 \times {}^3C_3}{4!}$

c).  ${}^{12}C_3$

d).  ${}^{12}C_3 \times {}^9C_3 \times {}^6C_3 \times {}^3C_3$

[2x25 = 50]

