

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.

[K] / [CO4]

3. If f and g are differentiable at x , then $\frac{d}{dx}(f(x) + g(x)) =$
- 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

[U] / [CO1]

4. The matrix $A = \begin{bmatrix} 0 & 1 & -1 \\ -1 & 0 & 1 \\ 1 & -1 & 0 \end{bmatrix}$ is _____

a). Scalar matrix

b). Unit Matrix

c). Symmetric Matrix

d). Skew-symmetric matrix

[U] / [CO4]

5. Find derivative of $x(2 - x)$

a). 2

b). $2 - 2x$ c). $2x$ d). x

[U] / [CO2]

6. What is the degree of the polynomial $3x + 2x^3 + 4 + x^2$

a). 1

b). 2

c). 3

d). 4

[A] / [CO4]

7. Find the derivative of $f(x)$ at $x = 0$ where $f(x) = (x^2 - 2)^2$

a). 0

b). -2

c). 1

d). -1

[U] / [CO4]

8. Find the value of $\sin 3x + \cos 3x$ at $x = 0$.

a). 2

b). 0

c). $3x$

d). 3

[A] / [CO4]

9. The number of triangles formed by joining the vertices of a polygon of m sides is

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

[A] / [CO4]

10. How many 8 letter words can be formed with the letters used in _____ any letter may be repeated any number of times?

a). $8!^8$

b). 8^8

c). 8×8

d). 8

11.

[U] / [CO4]

$\frac{d}{dx}(5) =$

a). 5

b). 0

c). 1

d). 2

12. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 3 & 4 & 1 \end{bmatrix}$ Then the order of A' is

[U] / [CO1]

a). 2×3

b). 3×2

c). 2×2

d). 3×3

13. The roots of the quadratic equation $x^2 - 8x + 7 = 0$ are

[U] / [CO2]

a). 1, -7

b). -1, 7

c). -1, -7

d). 1, 7

14. Which of the following is not a quadratic polynomial?

[U] / [CO2]

a). x^2

b). $x^2 + 1$

c). $x + 1$

d). $x^2 + x + 1$

15. 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

16. If A is a matrix of order 3×5 then each column has

[U] / [CO1]

a). 3 Elements

b). 5 Elements

c). 8 Elements

d). 2 Elements

17. is a factor the quadratic polynomial $2x^2 + 9x + 4$?

[A] / [CO2]

a). $2x + 1$

b). $2x - 1$

c). $x - 4$

d). $2x + 4$

18. Find $f(2)$ where $f(x) = x^2 + 5x - 14$

[A] / [CO2]

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]