JHARKHAND Rai University
RANCHI

PRACTICE SET 2025

Subject: Introductory Mathematics **Semester: I**
Program: B. Sc (Agriculture) **Branch:**
Subject code: BSC102

Unit – I

Marks: 01

1.If A =$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then the determinant of A is Understand (CO1) LOT

(a) -2 (b) 2 (c) 10 (d) -10

2. The order of a matrix with 3 rows and 4 columns is Remember (CO1) LOT

(a) 3 × 3 (b) 4 × 3 (c) 3 × 4 (d) 4 × 4

3. A matrix in which all elements are zero is called a Remember (CO1) LOT

(a) Unit matrix (b) Null matrix (c) Diagonal matrix (d) Identity matrix

4. **In a square matrix, the number of rows is Remember (CO1) LOT**

(a) Greater than columns (b) Less than columns (c) Equal to columns (d) None of these

5. The transpose of a matrix is obtained by Remember (CO1) LOT

(a) Changing the signs of elements (b) Interchanging rows and columns (c) Multiplying by a scalar (d) Dividing by a scalar

6. The product of a matrix A of order m × n and a matrix B of order n × p is of order Remember (CO1) LOT

(a) m × n (b) n × p (c) m × p (d) m × p

7. Determinant of an identity matrix of order 3 is Remember (CO1) LOT

(a) 0 (b) 1 (c) 2 (d) 3

8. **If A and B are matrices of the same order, then A+B = B+A shows Remember (CO1) LOT**

(a) Associative law (b) Commutative law (c) Distributive law (d) None of these

9. The inverse of a matrix A exists only if Remember (CO1) LOT

(a) Determinant of A = 0 (b) Determinant of A ≠ 0 (c) A is singular (d) A is diagonal

10. **If A is a 2 × 2 matrix, then |A| denotes Remember (CO1) LOT**
(a) Adjoint of A (b) Inverse of A (c) Determinant of A (d) Transpose of A

Marks: 10

11. Find inverse of the matrix if the matrix A = $\begin{bmatrix} 1 & 2 & -3 \\ 0 & 3 & 2 \\ 0 & 0 & -2 \end{bmatrix}$. Evaluate (CO1) HOT

12. If $= \begin{bmatrix} 1 & -1 & 0 \\ -2 & 3 & -4 \\ -2 & 3 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ then find A.B

13. By Matrix method solve the equation 3x – 3y + 4z = 5; 2x – 3y + 4z = 4; 0 – y + z = 0.

14. Find the 10^{th}, 20^{th} , 30^{th} , and n^{th} term of the series 1, 3, 5, 7, 9,……

15. The third term of an A.P is 18 and the seventh term is 30. Find the 16^{th} term.

Unit – II

Marks: 01

16. The derivative of x^n with respect to x is Understand (CO2) LOT
(a) n (b) x^{n-1} (c) nx^{n-1} (d) nx^n

17. The derivative of a constant is Understand (CO2) LOT
(a) 1 (b) 0 (c) The constant itself (d) Undefined

18. If $y=x^2$, then dy/dx=
(a) 2x (b) x^2 (c) x (d) $3x^2$

19. If y=sinx then dy/dx = Understand (CO2) LOT
(a) cosx (b) −cosx (c) sinx (d) –sinx

20. If $y=x^5-3x^2+7$, then dy / dx= Understand (CO2) LOT
(a) $5x^4-6x^5$ (b) $4x^3-6x$ (c) $5x^4+3x$ (d) $5x^5-3x$

21. The derivative of secx is Understand (CO2) LOT
(a) tanx (b) sec^2x (c) secxtanx (d) −secxtanx

22. The derivative of 1/x is Understand (CO2) LOT
(a) $-1/x^2$ (b) $1/x^2$ (c) lnx (d) 1/x

23. If $y=x^3+2x^2+x$, then dy/dx= Understand (CO2) LOT
(a) $3x^2+4x+1$ (b) 3x+4+1 (c) $3x^2+2x+1$ (d) $3x^3+4x^2$

24. The derivative of lnx is Understand (CO2) LOT
(a) x (b) 1/x (c) ln(x) (d) e^x

25. If $y=e^x$ dx/dy = Understand (CO2) LOT
(a) e^{2x} (b) e^x (c) lnx (d) 1/x

Marks: 10

26. Find the maximum and minimum value of the function f(x) = $(-3/4)x^4 – 8x^3 – (45/2)x^2 +105$
Evaluate (CO2) HOT

27. Differentiate $y=(x^2+1)/(x-1)$ using the quotient rule. Evaluate (CO2) HOT

28. Differentiate $y = (3x^2+2x)^5$ using the **chain rule**. Evaluate (CO2) HOT

29. Find the maximum and minimum value of the function $f(x) = x\sqrt{1-x}$ Evaluate (CO2) HOT

30. Differentiate y = x sinx log(1 + x) using the product rule. Evaluate (CO2) HOT

Unit – III

Marks: 01

31. $\int x^2 dx = ?$ **Understand (CO3) LOT**
(a)x^3 + C (b) $x^3/3$ + C (c)2x + C (d) 3x + C

32. $\int e^x dx = ?$**: Understand (CO3) LOT**
(a)e^x + C (b) lnx + C (c)xe^x + C (d) $1/e^x$ + C

33. $\int sinx dx = ?$ **Understand (CO3) LOT**
(a) -cosx + C (b) cosx + C (c) tanx + C (d) secx + C

34. $\int(3x^2+5)dx=$ Understand (CO3) LOT
(a) x^3+5x+C (b) x^3+5+C (c) x^3+5x^2+C (d) $3x^3+5x+C$

35. $\int xe^x dx$ is solved using: Remember (CO3) LOT
(a) Substitution (b) Partial fractions (c) Integration by parts (D) Trigonometric substitution

36. $\int_0^{\frac{\pi}{2}} cosx dx = ?$ **Understand (CO3) LOT**
(a) 1 (b) 0 (c) π/2 (d) 2

37. $\int_{-1}^{1} x^3 dx = ?$ **Understand (CO3) LOT**
(a) 1 (b) 0 (c) 2 (d) - 1

38. $\int_0^1 (x^2+1) dx = ?$ **Understand (CO3) LOT**
(a) 4/3 (b) 5/3 (c) 7/3 (d) None

39. $\int sec^2 x dx$= ? Understand (CO3) LOT
(a) tanx + C (b) secx + C (c) cotx + C (d)−cotx + C

40. $\int 1/x\ dx =$ Understand (CO3) LOT

(a) x + C (b) ln |x| + C (c) 1/x + C (d) $x^2 + C$

Marks: 10

41. Compute $\int(3x+2)e^{2x}$. Evaluate (CO3) HOT

42. Evaluate $\int 1/(x^2-4)\ dx$ Evaluate (CO3) HOT

43. Compute the definite integral $\int_0^{\pi} xsinxdx$ Evaluate (CO3) HOT

44. Evaluate $\int x^2 \sin(3x)\ dx$. Evaluate (CO3) HOT

45. Find the area enclosed between the curves y = x, $y = x^2$, between x=0 and x=1 Evaluate (CO3) HOT

Module – IV

Marks: 01

46. A mathematical model in agriculture is used to: Remember (CO 4) LOT

(a) Replace farmers completely (b) Predict and analyze crop behavior (c) Increase fertilizer cost (d) Reduce agricultural land

47. In curve fitting, the main objective is to: Remember (CO 4) LOT

(a). Find a curve that passes only through the origin (b). Find a curve that best represents given data (c). Remove all data errors (d). Change the data values

48. Yield prediction in agriculture often uses which type of model? Remember (CO 4) LOT

(a) Geometric (b) Statistical (c) Random (d) Constant

49. A quadratic curve has the general form: Remember (CO 4)

(a) y = mx+c (b) $y = ax^2 + bx + c$ (c) $y = kx^3$ (d) y = ax+bln

50. Which type of model represents relation between rainfall and crop yield? Remember (CO 4)

(a) Regression model (b) Geometric model (c) Chemical model (d) Trigonometric model

51. If the crop yield increases at a constant rate with fertilizer, the model used is: Remember (CO 4)

(a) Linear model (b) Quadratic model (c) Exponential model (d) Logistic model

52. Which is NOT an example of agricultural modeling? Remember (CO 4)

(a) Crop growth prediction (b) Disease spread simulation (c) Soil moisture model (d) Mobile phone battery model

53. When fitting a straight line, the form of the equation is: Remember (CO 4)

(a) $y = ax^3+b$ (b) y = mx + c (c) $y = ae^x$ (d) y = lnx

54. In curve fitting, the main objective is to: Remember (CO 4)
(a) Find a curve that passes only through the origin (b) Find a curve that best represents given data (c) Remove all data errors (d) Change the data values
55. Which type of model represents relation between rainfall and crop yield? Remember (CO 4)
(a) Regression model (b) Geometric model (c) Chemical model (d)Trigonometric model

Summary Sheet

CO Wise

CO	Q. No.	Marks
CO1	1 to 15	60
CO2	16 t0 30	60
CO3	31 to 46	60
CO4	47 to 55	10
		190

Unit Wise

Unit	Q. No.	Marks
Unit 1	1 to 15	60
Unit 2	16 t0 30	60
Unit 3	31 to 46	60
Unit 4	47 to 55	10
	Total =	**190**

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No.	Marks
LOT	1 to 10, 16 to 25, 31 to 40, 46 to 55	40
HOT	11 to 15, 26 to 30, 41 to 45	150
	Total =	**190**

Prepared by – Wakil Kumar

Disclaimer: - This is a practice set. The Question in End term examination will differ from the practice set. This practice set is meant for practice only.