



Question Bank for Multiple Choice Questions

Program: All Programs in Diploma Engineering	Program Code: - CE/CO/ME/EE/EJ
Scheme:-I	Semester:- 1
Course:- Basic Mathematics	Course Code:- 22103

01 – Algebra	Marks:-20
Content of Chapter:- 1.1 Logarithms 1.2 Determinants 1.3 Matrices 1.4 Partial Fractions	

1.1 Logarithms

1. The value of : $\log_a 1 = \text{---}$

- (A) 1 (B) 2
(C) 0 (D) a

Answer: - Option C

Explanation: - Basic Property of logarithm

2. The value of : $\log_{10} 10 = \text{-----}$

- (A) 1 (B) 2
(C) 0 (D) a

Answer: - Option A

Explanation: - Basic Property of logarithm

3. The value of $\log_a a = \text{-----}$

- (A) 1 (B) 2
(C) 0 (D) a

Answer: - Option A

Explanation: - Basic Property of logarithm

4. The value of: $\log_{81} 3 =$ _____.
- (A) 3 (B) $\frac{1}{4}$
(C) 81 (D) $\frac{2}{4}$

Answer: - Option B

Explanation: - Converting into Exponential form

5. The value of: $\log_5 625 =$ _____
- (A) 4 (B) 5
(C) 25 (D) 625

Answer: - Option A

Explanation: - Converting into Exponential form

6. The value of: $\log_3 81 =$ _____
- (A) 81 (B) 3
(C) 1 (D) 4

Answer: - Option D

Explanation: - Converting into Exponential form

7. The value of: $\log_{343} 7 =$
- (A) $\frac{1}{3}$ (B) $\frac{1}{4}$
(C) $\frac{1}{6}$ (D) $\frac{1}{5}$

Answer: - Option A

Explanation: - Converting into Exponential form

8. The value of x if $\log_3 27 = x$
- (A) 1 (B) 2
(C) 3 (D) 4

Answer: - Option C

Explanation: - Converting into Exponential form

9. The value of x if $\log_2(x-3) = 3$
- (A) 3 (B) 2
(C) 11 (D) 10

Answer: - Option C

Explanation:- Converting into Exponential form

10. The value of x if- $\log_2(x^2 - 6x + 40) = 5$
- (A) 4 (B) 2
(C) 4, 2 (D) 3

Answer: - Option C

Explanation: - Converting into Exponential form

11. The value of x if $\log_3(x+6) = 2$
- (A) 3 (B) 6
(C) 2 (D) 1

Answer: - Option A

Explanation: -Converting into Exponential form

12. If m, n, a are positive real numbers and $a \neq 1$ then $\log_a\left(\frac{m}{n}\right) = \text{-----}$
- (A) $\log_a m - \log_a n$ (B) $\log_a m + \log_a n$
(C) $\log_a m \log_a n$ (D) $\frac{\log_a m}{\log_a n}$

Answer: - Option A

Explanation: - Basic Property of logarithm

13. If m and a are positive real numbers. $a \neq 1$ then $\log_a(m)^n = \text{---}$
- (A) $\log_a m - \log_a n$ (B) $\log_a m + \log_a n$
(C) $n \log_a m$ (D) $\log_a m \log_a n$

Answer: - Option C

Explanation: - Basic Property of logarithm

14. If m, n, a are positive real numbers then $\log_a(mn) = \dots$
- (A) $\log_a m - \log_a n$ (B) $\log_a m + \log_a n$
 (C) $\log_a m \log_a n$ (D) $\frac{\log_a m}{\log_a n}$

Answer: - Option B

Explanation: - Basic Property of logarithm

15. The value of x if $\log_3(x + 5) = 4$
- (A) $x = 81$ (B) $x = 86$
 (C) $x = 76$ (D) $x = 91$

Answer: - Option C

Explanation: - Converting into Exponential form

16. The value of $\log\left(\frac{2}{3}\right) + \log\left(\frac{4}{5}\right) - \log\left(\frac{8}{15}\right)$.
- (A) 3 (B) 2
 (C) 1 (D) 0

Answer: - Option D

Explanation: - Use logarithm of product and quotient

17. The value of $\log\left(\frac{225}{32}\right) - \log\left(\frac{25}{81}\right) + \log\left(\frac{64}{729}\right)$
- (A) $\log 5$ (B) $\log 4$
 (C) $\log 2$ (D) $\log 3$

Answer: - Option C

Explanation: - Use logarithm of product and quotient

18. The value of $\frac{1}{\log_3 6} + \frac{1}{\log_8 6} + \frac{1}{\log_9 6} =$
- (A) 3 (B) 6
 (C) 8 (D) 9

Answer: - Option A

Explanation: - By Rule of change of base

19. The value of $\frac{1}{\log_{ab} abc} + \frac{1}{\log_{bc} abc} + \frac{1}{\log_{ac} abc} =$

- (A) 4 (B) 3
(C) 2 (D) 1

Answer: - Option C

Explanation: - By Rule of change of base

20. The value of : $\log\left(\frac{p^2}{qr}\right) + \log\left(\frac{q^2}{rp}\right) + \log\left(\frac{r^2}{pq}\right) = \text{----}$

- (A) 1 (B) 2
(C) 3 (D) 0

Answer: - Option D

Explanation: Use logarithm of product

21. The value of : $\log_y x^2 \times \log_z y^3 \times \log_x z^4 = \text{-----}$

- (A) 24 (B) 34
(C) 44 (D) 54

Answer: - Option A

Explanation: - Use log of power and Rule of change of base

22. The value of : $\frac{1}{\log_6 24} + \frac{1}{\log_{12} 24} + \frac{1}{\log_8 24} = \text{----}$

- (A) 1 (B) 2
(C) 3 (D) 4

Answer: - Option B

Explanation: - Use log of power and Rule of change of base

1.2 Determinants

23. Value of determinant $\begin{vmatrix} 5 & 3 \\ 2 & 4 \end{vmatrix} = \dots$

- (A) -14 (B) 14
(C) 12 (D) -12

Answer: - Option B

Explanation: - $=(5 \times 4) - (3 \times 2)$

24. Value of determinant $\begin{vmatrix} 2 & -4 \\ 2 & -1 \end{vmatrix} = \dots$

(A) -2

(B) 0

(C) -4

(D) 6

Answer: - Option D

Explanation: - $=(2 \times (-1)) - (2 \times (-4))$

25. Value of determinant $\begin{vmatrix} \sin\theta & \cos\theta \\ -\cos\theta & \sin\theta \end{vmatrix} = \dots$

(A) 2

(B) 0

(C) -1

(D) 1

Answer: - Option D

Explanation: - By evaluating determinant

26. Value of determinant $\begin{vmatrix} 2 & 3 & 5 \\ 1 & 4 & 2 \\ 3 & 1 & 6 \end{vmatrix} = \dots$

(A) -10

(B) 12

(C) -11

(D) -12

Answer: - Option C

Explanation: - By evaluating determinant

27. Value of determinant $\begin{vmatrix} 1 & 0 & 6 \\ 7 & 2 & 5 \\ 3 & 4 & 6 \end{vmatrix} = \dots$

(A) 138

(B) 124

(C) 110

(D) 120

Answer: - Option B

Explanation: - By evaluating determinant

28. For the equation $\begin{vmatrix} x & 4 \\ 3 & 6 \end{vmatrix} = 0$, the value of 'x' is ...

(A) 0

(B) 2

(C) 1

(D) -1

Answer: - Option B

Explanation: - By evaluating determinant

29. For the equation $\begin{vmatrix} x & 2 \\ 8 & 4 \end{vmatrix} = \begin{vmatrix} 1 & 1 \\ 2 & 2 \end{vmatrix}$, the value of 'x' is ...

- (A) 4 (B) 8
(C) 2 (D) 6

Answer: - Option A

Explanation: - By evaluating determinant

30. For the equation $\begin{vmatrix} x & -4 \\ 4 & x \end{vmatrix} = 0$, the value of 'x' is ...

- (A) 4 (B) 0
(C) -4 (D) ± 4

Answer: - Option D

Explanation: - By evaluating determinant

31. For the equation $\begin{vmatrix} 1 & 1 & 1 \\ 3 & x & 3 \\ 1 & x & 2 \end{vmatrix} = 0$, the value of 'x' is ...

- (A) 0 (B) 5
(C) 9 (D) 3

Answer: - Option D

Explanation: - By evaluating determinant

32. The solution of the system of equations $x + y + z = 6$, $2x + y - 2z = -2$, $x + y - 3z = -6$ is

- (A) 1,1,1 (B) 1,2,3
(C) 0,1,1 (D) 1,0,-1

Answer: - Option A

Explanation: - Use Cramer's rule for finding values of x,y,z

33. The solution of the system of equations $x + z = 4$, $y + z = 2$, $x + y = 0$ is

- (A) 3,1,0 (B) 1,-1,3
(C) 0,1,3 (D)) -3,0,-1

Answer: - Option B

Explanation: Use Cramer's rule for finding values of x,y,z

34. The voltages in an electric circuit are related by the equations. $V_1 + V_2 + V_3 = 9$, $V_1 - V_2 + V_3 = 3$, $V_1 + V_2 - V_3 = 1$ Then values of V_1 , V_2 , V_3 are

(A) 2,3,4

(B) 1,2,3

(C) 1,1,1

(D) 1,3,5

Answer: - Option A

Explanation: - Use Cramer's rule for finding values of x,y,z

35. The value of determinant 'D' in the system of equations $x - y - 2z = 1$, $2x + 3y + 4z = 4$, $3x - 2y - 6z = 5$ is

(A) -8

(B) -16

(C) 8

(D) 16

Answer: - Option A

Explanation: -Writing all equations in determinant form and evaluate determinant D.

36. The value of 'y' in the system of equations $x + y + z = 3$, $x - y + z = 1$, $x + y - 2z = 0$ is

(A) 0

(B) 1

(C) 2

(D) 3

Answer: - Option B

Explanation: -Use Cramer's rule and solve for y

1.3 Matrices

37. In a square matrix ...

(A) number of rows and columns are equal

(B) number of rows and columns are not equal

(C) number of rows is greater than columns

(D) number of columns is greater than rows

Answer: - Option A

Explanation: -By using definition of square matrix

38. Order of the matrix $\begin{bmatrix} 1 & 2 & -4 & 0 \end{bmatrix}$ is ...

(A) 1×1

(B) 1×4

(C) 4×1

(D) 4×4

Answer: - Option B

Explanation: - Order = number of rows into number of columns

39. Which of the following is scalar matrix...?

(A) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

(B) $\begin{bmatrix} 3 & 0 \\ 0 & 7 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 0 \\ 0 & 0 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$

Answer: - Option D

Explanation: -Use Defination of Scalar matrix

40. If $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 7 \\ 1 & 9 \end{bmatrix}$, then $2A+3B = \dots$

(A) $\begin{bmatrix} 12 & 35 \\ 18 & 19 \end{bmatrix}$

(B) $\begin{bmatrix} 13 & 27 \\ 11 & 37 \end{bmatrix}$

(C) $\begin{bmatrix} 22 & 15 \\ 13 & 45 \end{bmatrix}$

(D) $\begin{bmatrix} 10 & 20 \\ 30 & 15 \end{bmatrix}$

Answer: - Option B

Explanation: - Use Multiplication to matrix by scalar and then addition of matrices

41. If $\begin{bmatrix} 4 & 5 \\ -3 & 6 \end{bmatrix} + X = \begin{bmatrix} 10 & -1 \\ 0 & -6 \end{bmatrix}$, then matrix X = ...

(A) $\begin{bmatrix} 3 & 6 \\ 2 & -10 \end{bmatrix}$

(B) $\begin{bmatrix} 6 & -6 \\ 3 & -12 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 8 \\ 10 & 9 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & -8 \\ 1 & 5 \end{bmatrix}$

Answer: - Option B

Explanation: -Use Subtraction of matrices

42. If $\begin{bmatrix} -3 & x \\ 2y & 0 \end{bmatrix} + \begin{bmatrix} 4 & 6 \\ -3 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 7 \\ -5 & 1 \end{bmatrix}$, then values 'x' & 'y' are ...

(A) 1,-2

(B) 0,1

(C) 2,0

(D) 1,-1

Answer: - Option D

Explanation: -. Use Addition and Equality of matrices

43. If order of matrix 'A' is 2×3 and order of matrix 'B' is 3×4 , then order of their multiplication matrix 'AB' is ...

(A) 2×2

(B) 3×3

(C) 2×4

(D) 4×4

Answer: - Option C

Explanation: - Use Inner product of Matrices

44. If $A = \begin{bmatrix} 3 & 4 & -2 \\ 2 & 1 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 2 & -1 \\ 3 & 4 \\ 0 & 2 \end{bmatrix}$, then $(AB) =$

(A) $\begin{bmatrix} 18 & 9 \\ 7 & 2 \end{bmatrix}$

(B) $\begin{bmatrix} 6 & 9 \\ 7 & -12 \end{bmatrix}$

(C) $\begin{bmatrix} 12 & 8 \\ 7 & 9 \end{bmatrix}$

(D) $\begin{bmatrix} 2 & 18 \\ 6 & -9 \end{bmatrix}$

Answer: - Option A

Explanation: -. Use Multiplication of 2 Matrices

45. If $A = \begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 4 \\ 4 & -5 \end{bmatrix}$, then $AB = \dots$

- (A) O (B) I
(C) A^{-1} (D) B^{-1}

Answer: - Option B

Explanation: - Use Multiplication of 2 Matrices

46. If $\begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} x & y & 3 \\ 3 & -1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 0 & 7 \\ 9 & 4 & 13 \end{bmatrix}$, then values of 'x' & 'y'...

- (A) 2,2 (B) 1,2
(C) 1,1 (D) 0,0

Answer: - Option B

Explanation: - Use Multiplication of 2 Matrices

47. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$, then $A^T = \dots$

- (A) $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ (B) $\begin{bmatrix} 6 & 5 & 4 \\ 3 & 2 & 1 \end{bmatrix}$
(C) $\begin{bmatrix} 1 & 3 & 5 \\ 6 & 4 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{bmatrix}$

Answer: - Option D

Explanation: -. By interchanging rows and columns

48. $(AB)^T = \dots$

- (A) $A^T \cdot B^T$ (B) $B^T \cdot A^T$
(C) $A^T + B^T$ (D) none of these

Answer: - Option B

Explanation: - Use Property of Transposition of Matrices.

49. $(A^T)^T = \dots$

- (A) O (B) A
(C) I (D) none of these

Answer: - Option B

Explanation: - Use Definition of Transposition of Matrices

50. A matrix 'A' is called orthogonal iff $A \cdot A^T = \dots$

- (A) O (B) A
(C) I (D) none of these

Answer: - Option C

Explanation: - Use Property of Transposition of Matrices

51. The matrix 'A' is called singular iff $|A|$...

- (A) = 0 (B) = I
(C) $\neq 0$ (D) = A

Answer: - Option C

Explanation: - Use Definition of singular Matrix

52. $|AB|$ = ...

- (A) $|A|$ (B) $|B|$
(C) $|I|$ (D) $|A||B|$

Answer: - Option D

Explanation: - Use Property of Determinant of Matrices

53. The matrix $\begin{bmatrix} 4 & 6 \\ 2 & 3 \end{bmatrix}$ is ...

- (A) singular (B) non-singular
(C) symmetric (D) skew-symmetric

Answer: - Option A

Explanation: -. As determinant is zero hence singular matrix

54. In the matrix $\begin{bmatrix} 1 & 2 & 3 \\ -4 & 5 & 6 \\ -7 & 8 & 9 \end{bmatrix}$, then minor of element '6' is ...

- (A) 12 (B) 32
(C) 42 (D) 22

Answer: - Option D

Explanation: - Solve determinant by eliminating second row and third column.

55. In the matrix $\begin{bmatrix} 2 & -3 & 4 \\ 0 & 1 & -5 \\ 6 & 2 & -4 \end{bmatrix}$, cofactor of element '0' is ...

- (A) -4 (B) 4
(C) 20 (D) -20

Answer: - Option A

Explanation: - Solve determinant by eliminating second row and first column

56. The adjoint of matrix $\begin{bmatrix} 6 & 5 \\ 2 & 1 \end{bmatrix}$ is ...

- (A) $\begin{bmatrix} 1 & -9 \\ 7 & 2 \end{bmatrix}$ (B) $\begin{bmatrix} 6 & 9 \\ 7 & -12 \end{bmatrix}$
(C) $\begin{bmatrix} 1 & -5 \\ -2 & 6 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 1 \\ -6 & -9 \end{bmatrix}$

Answer: - Option C

Explanation: - Find Cofactors and matrix of cofactors

57. Inverse of a square matrix 'A' exists, iff A is ...

- (A) singular (B) non-singular
(C) symmetric (D) skew-symmetric

Answer: - Option B

Explanation: - Condition Of Inverse of a matrix

58. $A \cdot A^{-1} = \dots$

- (A) A^T (B) null matrix
(C) I (D) none of these

Answer: - Option C

Explanation: - Property Of Inverse of a matrix

59. $(A^{-1})^{-1} = \dots$

- (A) O (B) A
(C) I (D) none of these

Answer: - Option B

Explanation: - Property Of Inverse of a matrix.

60. If $A = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$, then $A^{-1} = \dots$

- (A) $\begin{bmatrix} 2 & -5 \\ -1 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 6 & 1 \\ 5 & -1 \end{bmatrix}$
(C) $\begin{bmatrix} 1 & -5 \\ -2 & 6 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 1 \\ -6 & -9 \end{bmatrix}$

Answer: - Option A

Explanation: - Find adjoint and determinant of matrix

61. If $A = \begin{bmatrix} 2 & 4 \\ 6 & 8 \end{bmatrix}$, then $A^{-1} = \dots$

- (A) $\begin{bmatrix} -2 & 4 \\ 6 & -8 \end{bmatrix}$ (B) $\begin{bmatrix} 8 & 4 \\ 6 & 2 \end{bmatrix}$
(C) $\begin{bmatrix} 2 & -4 \\ -6 & 8 \end{bmatrix}$ (D) $\begin{bmatrix} -8 & 4 \\ 6 & -2 \end{bmatrix}$

Answer: - Option D

Explanation: - Find adjoint and determinant of matrix

62. Which of the following is proper fraction?

- (A) $\frac{x-2}{x^3+1}$ (B) $\frac{x^3+1}{x-2}$
(C) $\frac{x^4}{x^3+1}$ (D) $\frac{x^3+1}{x^4}$

Answer: - Option A

Explanation: - Definition of proper fraction

63. Which of the following is improper fraction?

(A) $\frac{x-2}{x^3+1}$

(B) $\frac{x^3+1}{(x-2)^4}$

(C) $\frac{x^3+1}{x^4}$

(D) $\frac{x^4}{x^3+1}$

Answer: - Option D

Explanation: - Definition of Improper fraction

64. Which of the following has irreducible Quadratic Denominator?

(A) $\frac{x-2}{x^2-4}$

(B) $\frac{x-1}{x^2+4}$

(C) $\frac{x-4}{x^3-9}$

(D) $\frac{x-4}{x^2-9}$

Answer: - Option B

Explanation: - Definition of irreducible quadratic factor

65. Which of the following has reducible Quadratic Denominator?

(A) $\frac{x-2}{x^2-4}$

(B) $\frac{x-4}{x^2+9}$

(C) $\frac{x-4}{x^3+9}$

(D) $\frac{x-1}{x^2+4}$

Answer: - Option A

Explanation: - Definition of reducible quadratic factor

66. The partial fractions of $\frac{x}{x^2+x-2}$ are

(A) $\frac{1}{3} \left[\frac{2}{x+2} + \frac{1}{x-1} \right]$

(B) $\frac{1}{2} \left[\frac{3}{x+2} - \frac{1}{x-1} \right]$

(C) $\frac{1}{2} \left[\frac{3}{x+2} + \frac{1}{x-1} \right]$

(D) $\frac{1}{3} \left[\frac{2}{x+2} - \frac{1}{x-1} \right]$

Answer: - Option C

Explanation: - Denominator has non repeated linear factors

67. Values of A and B in partial fraction of $\frac{e^x+1}{(e^x+2)(e^x+3)}$ are

(A) -1,2

(B) 2,-1

(C) 2,1

(D) 1,2

Answer: - Option A

Explanation: - Denominator has non repeated linear factors, put $e^x = t$

68. Partial fraction of $\frac{1}{x^3-x}$ are

(A) $\frac{1}{2} \left[\frac{1}{x+1} + \frac{1}{x-1} \right] + \frac{1}{x}$

(B) $\frac{1}{2} \left[\frac{1}{x+1} - \frac{1}{x-1} \right] - \frac{1}{x}$

(C) $\frac{1}{2} \left[\frac{1}{x+1} - \frac{1}{x-1} \right] + \frac{1}{x}$

(D) $\frac{1}{2} \left[\frac{1}{x+1} + \frac{1}{x-1} \right] - \frac{1}{x}$

Answer: - Option D

Explanation: - Denominator has non repeated linear factors

69. Partial fraction of $\frac{1}{1-x^2}$ are

(A) $\frac{1}{2} \left[\frac{1}{1+x} + \frac{1}{1-x} \right]$

(B) $\frac{1}{2} \left[\frac{1}{1+x} - \frac{1}{x-1} \right]$

(C) $\frac{1}{2} \left[\frac{1}{1+x} - \frac{1}{1-x} \right]$

(D) $\frac{1}{2} \left[\frac{1}{1+x} + \frac{1}{x-1} \right]$

Answer: - Option A

Explanation: - Denominator has non repeated linear factors

70. Partial fraction of $\frac{1}{x^2-x}$ are

(A) $\frac{1}{x-1} - \frac{1}{x}$

(B) $\frac{1}{x} - \frac{1}{x-1}$

(C) $\frac{1}{x} + \frac{1}{x-1}$

(D) $\frac{1}{x-1} + \frac{1}{x}$

Answer: - Option A

Explanation: - Denominator has non repeated linear factors

71. Partial fraction of $\frac{1}{x^2+3x+2}$ are

(A) $\frac{1}{x+2} - \frac{1}{x+1}$

(B) $\frac{1}{x+1} - \frac{1}{x+2}$

(C) $\frac{1}{x+2} + \frac{1}{x+1}$

(D) $\frac{1}{x+2} + \frac{2}{x+1}$

Answer: - Option B

Explanation: - Denominator has non repeated linear factors

72. Proper fraction after polynomial division of $\frac{x^2+1}{x^2-1}$ is

(A) $\frac{2}{x^2-1}$

(B) $\frac{2}{x^2+1}$

(C) $\frac{1}{x^2-1}$

(D) $\frac{1}{x^2+1}$

Answer: - Option A

Explanation: - Taking actual polynomial division

73. Proper fraction after polynomial division of $\frac{x^4}{x^3+1}$ is

(A) $\frac{x}{x^3+1}$

(B) $\frac{-x}{x^3+1}$

(C) $\frac{x}{x^3-1}$

(D) $\frac{-x}{x^3-1}$

Answer: - Option B

Explanation: - Converting it into proper fraction

74. Partial fraction of $\frac{1}{x^2-1}$ are

(A) $\frac{1}{2} \left[\frac{1}{x-1} - \frac{1}{x+1} \right]$

(B) $\frac{1}{2} \left[\frac{1}{x+1} - \frac{1}{x-1} \right]$

(C) $\frac{1}{2} \left[\frac{1}{x-1} + \frac{1}{x+1} \right]$

(D) $\frac{1}{3} \left[\frac{1}{x+1} - \frac{1}{x-1} \right]$

Answer: - Option A

Explanation: - Denominator has non repeated linear factors

75. Partial fraction of $\frac{x-2}{x^2-x}$ are

(A) $\frac{2}{x} + \frac{1}{x^2-1}$

(B) $\frac{2}{x} - \frac{1}{x-1}$

(C) $\frac{2}{x} + \frac{1}{x^2+1}$

(D) $\frac{2}{x} - \frac{1}{x^2+1}$

Answer: - Option B

Explanation: - Denominator has non repeated linear factors

76. Partial fraction of $\frac{x^2-x+3}{(x-2)(x^2+1)}$ are

(A) $\frac{1}{x-2} + \frac{1}{x^2+1}$

(B) $\frac{1}{x-2} - \frac{1}{x^2+1}$

(C) $\frac{1}{x-2} - \frac{1}{x^2-1}$

(D) $\frac{1}{x+2} - \frac{1}{x^2-1}$

Answer: - Option B

Explanation: - Denominator has irreducible quadratic factor

77. Partial fraction of $\frac{x+4}{x^2+x}$ are

(A) $\frac{4}{x} - \frac{3}{x-1}$

(B) $\frac{4}{x} + \frac{3}{x-1}$

(C) $\frac{4}{x} + \frac{3}{x+1}$

(D) $\frac{4}{x} - \frac{3}{x+1}$

Answer: - Option D

Explanation: - Denominator has non repeated linear factors

78. Partial fraction of $\frac{x-1}{x(x^2+1)}$ are

(A) $\frac{x+1}{x^2+1} - \frac{1}{x}$

(B) $\frac{x+1}{x^2-1} - \frac{1}{x}$

(C) $\frac{x+1}{x^2+1} + \frac{1}{x}$

(D) $\frac{x-1}{x^2+1} - \frac{1}{x}$

Answer: - Option A

Explanation: - Denominator has irreducible quadratic factor

79. Partial fraction of $\frac{x^3}{x^2-1}$ are

(A) $x + \frac{1}{2} \left[\frac{1}{x-1} + \frac{1}{x+1} \right]$

(B) $x - \frac{1}{2} \left[\frac{1}{x-1} - \frac{1}{x+1} \right]$

(C) $x - \frac{1}{2} \left[\frac{1}{x-1} + \frac{1}{x+1} \right]$

(D) $x + \frac{1}{2} \left[\frac{1}{x-1} - \frac{1}{x+1} \right]$

Answer: - Option A

Explanation: - Converting it into proper fraction

80. Partial fraction of $\frac{x-2}{x^2-x}$ are

(A) $\frac{2}{x} + \frac{1}{x-1}$

(B) $\frac{2}{x} - \frac{1}{x-1}$

(C) $\frac{2}{x} - \frac{1}{x+1}$

(D) $\frac{2}{x} + \frac{3}{x+1}$

Answer: - Option B

Explanation: - Denominator has non repeated linear factors

81. Partial fraction of $\frac{x+1}{x^3-x^2}$ are

(A) $\frac{2}{x-1} - \frac{2}{x} + \frac{1}{x^2}$

(B) $\frac{2}{x+1} - \frac{2}{x} + \frac{1}{x^2}$

(C) $\frac{2}{x-1} - \frac{2}{x} - \frac{1}{x^2}$

(D) $\frac{2}{x-1} + \frac{2}{x} - \frac{1}{x^2}$

Answer: - Option C

Explanation: - Denominator has repeated linear factors

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Question Bank for Multiple Choice Questions

Program: All Programs in Diploma Engineering	Program Code: - CE/CO/ME/EE/EJ
Scheme: - I	Semester: - 1
Course: - Basic Mathematics	Course Code: - 22103

02 – Trigonometry	Marks: - 14
Content of Chapter:- 5.1 Range, coefficient of range of discrete and grouped data. 5.2 Mean deviation and standard deviation from mean of grouped and ungrouped data, weighted means. 5.3 Variance and coefficient of variance. 5.4 Comparison of two sets of observation.	

1. If A and B are two angles then A+B is called

- (A) Compound Angle (B) Allied Angle
(C) Multiple Angle (D) Sub-multiple angle

Answer: - Option A

Explanation: - By definition of compound angle

2. $\sin(A + B) =$ _____

- (A) $\sin A \cos B - \cos A \sin B$ (B) $\cos A \cos B + \sin A \sin B$
(C) $\cos A \cos B - \sin A \sin B$ (D) $\sin A \cos B + \cos A \sin B$

Answer: - Option D

Explanation: - By Formula $\sin(A + B) = \sin A \cos B + \cos A \sin B$

3. $\sin(A - B) =$ _____

- (A) $\sin A \cos B - \cos A \sin B$ (B) $\cos A \cos B + \sin A \sin B$
(C) $\cos A \cos B - \sin A \sin B$ (D) $\sin A \cos B + \cos A \sin B$

Answer: - Option A

Explanation: - By Formula $\sin(A - B) = \sin A \cos B - \cos A \sin B$

4. $\cos(A - B) =$ _____

- (A) $\sin A \cos B - \cos A \sin B$ (B) $\cos A \cos B + \sin A \sin B$
(C) $\cos A \cos B - \sin A \sin B$ (D) $\sin A \cos B + \cos A \sin B$

Answer: - Option B

Explanation: - By Formula $\cos(A - B) = \cos A \cos B + \sin A \sin B$

5. $\cos(A + B) =$ _____

(A) $\sin A \cos B - \cos A \sin B$

(B) $\cos A \cos B + \sin A \sin B$

(C) $\cos A \cos B - \sin A \sin B$

(D) $\sin A \cos B + \cos A \sin B$

Answer: - Option C

Explanation: - By Formula $\cos(A + B) = \cos A \cos B - \sin A \sin B$

6. $\tan(A - B) =$ _____

(A) $\frac{\tan A + \tan B}{1 + \tan A \tan B}$

(B) $\frac{\tan A + \tan B}{1 - \tan A \tan B}$

(C) $\frac{\tan A - \tan B}{1 + \tan A \tan B}$

(D) $\frac{\tan A - \tan B}{1 - \tan A \tan B}$

Answer: - Option C

Explanation: - By Formula $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

7. $\tan(A + B) =$ _____

(A) $\frac{\tan A + \tan B}{1 + \tan A \tan B}$

(B) $\frac{\tan A + \tan B}{1 - \tan A \tan B}$

(C) $\frac{\tan A - \tan B}{1 + \tan A \tan B}$

(D) $\frac{\tan A - \tan B}{1 - \tan A \tan B}$

Answer: - Option A

Explanation: - According to definition of Variance.

8. $\sin A \cos B + \cos A \sin B$ is an expansion of...

(A) $\cos(A - B)$

(B) $\sin(A - B)$

(C) $\sin(A + B)$

(D) $\cos(A + B)$

Answer: - Option C

Explanation: - By Formula $\sin(A + B) = \sin A \cos B + \cos A \sin B$

9. $\sin A \cos B - \cos A \sin B$ is an expansion of...

(A) $\cos(A - B)$

(B) $\sin(A - B)$

(C) $\sin(A + B)$

(D) $\cos(A + B)$

Answer: - Option B

Explanation: - By Formula $\sin(A - B) = \sin A \cos B - \cos A \sin B$

10. $\cos A \cos B - \sin A \sin B$ is an expansion of...

(A) $\cos(A - B)$

(B) $\sin(A - B)$

(C) $\sin(A + B)$

(D) $\cos(A + B)$

Answer: - Option D

Explanation: - By Formula $\cos(A + B) = \cos A \cos B - \sin A \sin B$

11. $\cos A \cos B + \sin A \sin B$ is an expansion of...

- (A) $\cos(A - B)$ (B) $\sin(A - B)$
(C) $\sin(A + B)$ (D) $\cos(A + B)$

Answer: - Option A

Explanation: - By Formula $\cos(A - B) = \cos A \cos B + \sin A \sin B$.

12. $\frac{\tan A - \tan B}{1 + \tan A \tan B}$ is an expansion of

- (A) $\tan(A + B)$ (B) $\tan 2A$
(C) $\tan(A - B)$ (D) $\tan 2B$

Answer: - Option C

Explanation: - By Formula $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

13. $\frac{\tan A + \tan B}{1 - \tan A \tan B}$ is an expansion of

- (A) $\tan(A + B)$ (B) $\tan 2A$
(C) $\tan(A - B)$ (D) $\tan 2B$

Answer: - Option A

Explanation: - By Formula $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

14. Find the value of $\cos(75^\circ)$

- (A) $\frac{1 - \sqrt{3}}{2\sqrt{2}}$ (B) $\frac{\sqrt{3} - 1}{2\sqrt{2}}$
(C) $\frac{1 + \sqrt{3}}{2\sqrt{2}}$ (D) $\frac{\sqrt{3} + 1}{2\sqrt{2}}$

Answer: - Option B

Explanation: - $\cos(75^\circ) = \cos(45^\circ + 30^\circ)$
Now apply formula $\cos(A + B) = \cos A \cos B - \sin A \sin B$ for finding value of $\cos(75^\circ)$

15. If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$ then $\tan(A + B)$ is

- (A) 1 (B) -1
(C) 0 (D) 2

Answer: - Option A

Explanation: - Solve by using $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

16. $\sin \alpha \cos(\beta - \alpha) + \cos \alpha \sin(\beta - \alpha)$ is equal to

- (A) $\cos \alpha$ (B) $\cos \beta - \alpha$
(C) $\sin \beta - \alpha$ (D) $\sin \beta$

Answer: - Option D

Explanation: - Using formula $\sin(A + B) = \sin A \cos B + \cos A \sin B$

17. $\frac{\cot A - \cot 2A}{\cot A + \cot 2A} = \frac{\sin A}{\sin 3A}$ is
- (A) $\frac{\sin A}{\sin 3A}$ (B) $\frac{\cos A}{\cos 3A}$
 (C) $\frac{\tan A}{\tan 3A}$ (D) None of These

Answer: - Option A

Explanation: - Use $\cot A = \frac{\cos A}{\sin A}$ and $\cot 2A = \frac{\cos 2A}{\sin 2A}$,

Simplify it.

Then use $\sin(A + B) = \sin A \cos B + \cos A \sin B$

and $\sin(A - B) = \sin A \cos B - \cos A \sin B$

You will find above result is true.

18. If $\tan A = 1$ and $\tan B = 2$ then $\tan C = \dots$, Where A, B, C are the angles of a triangle.
- (A) 2 (B) 1
 (C) 4 (D) 4

Answer: - Option C

Explanation: - Since A, B, C are angles of triangle $\therefore A + B + C = 180^\circ$

$$\Rightarrow A + B = 180^\circ - C$$

Operate tangent ratio on both side and use

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B} \text{ and } \tan(\pi - \theta) = -\tan \theta$$

19. Find the value of $\sin(15^\circ)$

- (A) $\frac{1-\sqrt{3}}{2\sqrt{2}}$ (B) $\frac{\sqrt{3}-1}{2\sqrt{2}}$
 (C) $\frac{1+\sqrt{3}}{2\sqrt{2}}$ (D) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

Answer: - Option B

Explanation: - Using compound angle formula $\cos(A + B)$

Find the value of $\operatorname{cosec}(105^\circ)$

20. (A) $\frac{1-\sqrt{3}}{2\sqrt{2}}$ (B) $\frac{2\sqrt{2}}{\sqrt{3}+1}$
 (C) $\frac{2\sqrt{2}}{1+\sqrt{3}}$ (D) Both b and c

Answer: - Option D

Explanation: - Using relation $\operatorname{cosec} \theta = \frac{1}{\sin \theta}$ and compound angle formula $\sin(A + B)$

21. Find the value of $\tan(15^\circ)$

- (A) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ (B) $\frac{\sqrt{3}+1}{\sqrt{3}-1}$
 (C) $\frac{1+\sqrt{3}}{2\sqrt{2}}$ (D) $\frac{\sqrt{3}-1}{2\sqrt{2}}$

Answer: - Option A

Explanation: - Using compound angle formula $\tan(A - B)$

22. If A, B, and C are angles of a triangle, then we can write $\cot \frac{(B+C)}{2}$ as
- (A) $\tan\left(\frac{A}{2}\right)$ (B) $\tan\left(\frac{B+C}{2}\right)$
 (C) $\frac{\tan(B+C)}{2}$ (D) $\tan\left(\frac{B}{2}\right)$

Answer: - Option A

Explanation: - Since A, B, C are angles of triangle $\therefore A + B + C = 180^\circ \Rightarrow B + C = 180^\circ - A$
 Operate cotangent ratio on both side

23. Let $\cos(\alpha + \beta) = \frac{4}{5}$ and let $\sin(\alpha - \beta) = \frac{5}{13}$, where $0 \leq \alpha, \beta \leq \frac{\pi}{4}$. Then $\tan 2\alpha = ?$
- (A) $\frac{25}{16}$ (B) $\frac{56}{33}$
 (C) $\frac{19}{12}$ (D) $\frac{19}{12}$

Answer: - Option B

Explanation: - Using trigonometric formulae $\sin^2 A = \cos^2 A - 1$ and $\cos^2 A = \sin^2 A - 1$,
 And compound angle formulae

24. Find the value of $\sin(-765^\circ)$
- (A) $-\frac{1}{\sqrt{2}}$ (B) $\frac{1}{\sqrt{2}}$
 (C) $-\frac{1}{2}$ (D) $\frac{1}{2}$

Answer: - Option A

Explanation: - $\sin(-765^\circ) = -\sin 765^\circ = -\sin(2 \times 360^\circ + 45^\circ)$ Since $\sin(2\pi + \theta) = \sin \theta$

25. Find the value of $\tan(1050^\circ)$
- (A) $\frac{1}{2}$ (B) $\frac{1}{\sqrt{3}}$
 (C) $\frac{1}{3}$ (D) $-\frac{1}{\sqrt{3}}$

Answer: - Option D

Explanation: - Use allied angle concept

26. The value of $\cos(90^\circ + 8) \sec(-8) \tan 180^\circ - 8) / \sec(360^\circ - 8) \sin 180^\circ + 8) \cot(90^\circ - 8)$ is
- (A) $\cos 8$ (B) 1
 (C) $\sin 8$ (D) -1

Answer: - Option D

Explanation: -

27. The value of $\sin(180^\circ + 8) \cot(90^\circ - 8) / \sec(-8) + \sin 28$ is
- (A) -1 (B) 1
 (C) 1 (D) -2

Answer: - Option C

Explanation: -

28. The value of $\tan 720^\circ - \cos 630^\circ - \sin 150^\circ \cos 120^\circ$ is

- (A) $\frac{1}{4}$ (B) $\frac{1}{3}$
(C) $\frac{1}{2}$ (D) 1

Answer: - Option A

Explanation: -

29. $\sin\left(\frac{\pi}{2} - \theta\right) = \underline{\hspace{2cm}}$

- (A) $\sin \theta$ (B) $\cos \theta$
(C) $-\sin \theta$ (D) $-\cos \theta$

Answer: - Option B

Explanation: - Standard Allied angle ratio

30. $\cos\left(\frac{\pi}{2} + \theta\right) = \underline{\hspace{2cm}}$

- (A) $\sin \theta$ (B) $\cos \theta$
(C) $-\sin \theta$ (D) $-\cos \theta$

Answer: - Option C

Explanation: - Standard Allied angle ratio

31. $\tan(\pi - \theta) = \underline{\hspace{2cm}}$

- (A) $\tan \theta$ (B) $-\tan \theta$
(C) $\cot \theta$ (D) $-\cot \theta$

Answer: - Option B

Explanation: - Standard Allied angle ratio

32. $\cot(\pi + \theta) = \underline{\hspace{2cm}}$

- (A) $\tan \theta$ (B) $-\tan \theta$
(C) $\cot \theta$ (D) $-\cot \theta$

Answer: - Option C

Explanation: - Standard Allied angle ratio

33. $\operatorname{cosec}(2\pi - \theta) = \underline{\hspace{2cm}}$

- (A) $\operatorname{cosec} \theta$ (B) $-\sec \theta$
(C) $\cot \theta$ (D) $-\operatorname{cosec} \theta$

Answer: - Option D

Explanation: - Standard Allied angle ratio

34. Find the value of $\cot\left(\frac{19\pi}{6}\right)$

(A) $\sqrt{3}$

(B) $-\sqrt{3}$

(C) 3

(D) -3

Answer: - Option A

Explanation: - Solved by using allied angle formula $\cot(3\pi + \theta) = \cot\theta$

35. Find the value of $\tan(225^\circ) \cot(405^\circ) + \tan(765^\circ) \cot(765^\circ)$

(A) 1

(B) 2

(C) -2

(D) -1

Answer: - Option B

Explanation: - Use allied angle formula for tangent and cotangent ratio also use $\tan\theta \cdot \cot\theta = 1$

36. If θ be the angle then $2\theta, 3\theta, 4\theta$, are called as.....

(A) Compound angles

(B) Allied Angle

(C) Multiple angle

(D) Sub-multiple angles

Answer: - Option C

Explanation: - By definition of Multiple angles

37. If θ be the angle then $\frac{\theta}{2}, \frac{\theta}{3}, \frac{\theta}{4}$ are called as

(A) Compound angles

(B) Allied Angle

(C) Multiple angle

(D) Sub-multiple angles

Answer: - Option D

Explanation: - By definition of Multiple angles

38. Find $\sin\alpha$ if $\tan\left(\frac{\alpha}{2}\right) = \frac{1}{\sqrt{3}}$

(A) $\frac{1}{\sqrt{3}}$

(B) $\frac{\sqrt{3}}{2}$

(C) $\sqrt{3}$

(D) 1

Answer: - Option B

Explanation: - By using Multiple and sub-multiple angle formulae $\sin\alpha = \frac{2 \tan\left(\frac{\alpha}{2}\right)}{1 + \tan^2\left(\frac{\alpha}{2}\right)}$

39. What is $\cot A + \operatorname{cosec} A$ is equal to _____

(A) $\tan\left(\frac{A}{2}\right)$

(B) $\cot\left(\frac{A}{2}\right)$

(C) $2\cot\left(\frac{A}{2}\right)$

(D) $2\tan\left(\frac{A}{2}\right)$

Answer: - Option B

Explanation: - Concept $\cos 2A = \cos^2 A - 1$ and $\sin 2A = 2\sin A \cos A$

40. If $\sin A = 0.4$ then find value of $\cos 2A$

- (A) 0.50 (B) 0.68
(C) 0.60 (D) 1

Answer: - Option B

Explanation: - Use $\cos 2A = 1 - 2 \sin^2 A$ to solve above example

41. What is $\sin C + \sin D$ equal to _____

- (A) $2 \sin\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$ (B) $-2 \sin\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$
(C) $2 \cos\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$ (D) $2 \cos\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$

Answer: - Option A

Explanation: - By definition of Multiple angles

42. What is $\sin C - \sin D$ equal to?

- (A) $2 \sin\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$ (B) $-2 \sin\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$
(C) $2 \cos\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$ (D) $-2 \cos\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$

Answer: - Option C

Explanation: - By factorization formula $\sin C - \sin D = 2 \cos\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$

43. What is $\cos C - \cos D$ equal to?

- (A) $2 \sin\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$ (B) $-2 \sin\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$
(C) $2 \cos\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$ (D) $-2 \cos\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$

Answer: - Option B

Explanation: - By factorization formula $\cos C - \cos D = -2 \sin\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$

44. What is $\cos C + \cos D$ equal to?

- (A) $2 \sin\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$ (B) $-2 \sin\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$
(C) $-2 \sin\left(\frac{C+D}{2}\right) \cdot \sin\left(\frac{C-D}{2}\right)$ (D) $2 \cos\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$

Answer: - Option D

Explanation: - By factorization formula $\cos C + \cos D = 2 \cos\left(\frac{C+D}{2}\right) \cdot \cos\left(\frac{C-D}{2}\right)$

45. $2 \sin A \cdot \cos B$ can be expressed as

- (A) $\sin(A + B) + \sin(A - B)$ (B) $\sin(A + B) - \sin(A - B)$
(C) $\cos(A + B) + \cos(A - B)$ (D) $\cos(A + B) - \cos(A - B)$

Answer: - Option A

Explanation: - By defactorisation formula $2 \sin A \cdot \cos B = \sin(A + B) + \sin(A - B)$

46. $2 \cos A \cdot \cos B$ can be expressed as

- (A) $\sin(A + B) + \sin(A - B)$ (B) $\sin(A + B) - \sin(A - B)$
(C) $\cos(A + B) + \cos(A - B)$ (D) $\cos(A + B) - \cos(A - B)$

Answer: - Option C

Explanation: - By defactorisation formula $2 \cos A \cos B = \cos(A + B) + \cos(A - B)$

47. $2 \sin 15^\circ \cos 5^\circ$ can be expressed as

- (A) $2 \sin 25^\circ \cos 5^\circ$ (B) $\sin 20^\circ \cos 5^\circ$
(C) $\sin 20^\circ \sin 10^\circ$ (D) $\sin 15^\circ \sin 25^\circ$

Answer: - Option C

Explanation: - By defactorisation formula $2 \sin A \cdot \cos B = \sin(A + B) + \sin(A - B)$

48. Express $\cos \frac{\pi}{4} + \cos \frac{\pi}{6}$ into the product form

- (A) $\cos \frac{5\pi}{24} + \cos \frac{\pi}{24}$ (B) $2 \cos \frac{5\pi}{24} + \cos \frac{\pi}{24}$
(C) $\sin \frac{5\pi}{24} + \sin \frac{\pi}{24}$ (D) $2 \sin \frac{5\pi}{24} + \sin \frac{\pi}{24} \sin \frac{\pi}{6}$

Answer: - Option B

Explanation: - By factorization formula $\cos C + \cos D = 2 \cos \left(\frac{C+D}{2}\right) \cdot \cos \left(\frac{C-D}{2}\right)$

49. If $2 \sin 40 \cos 10 = \sin A + \sin B$ find A & B

- (A) A = 30, B = 50 (B) A = 10, B = 40
(C) A = 40, B = 10 (D) A = 50, B = 30

Answer: - Option B

Explanation: - By defactorisation formula $2 \sin A \cdot \cos B = \sin(A + B) + \sin(A - B)$

50. Value for complementary relation $\sin^{-1}x + \cos^{-1}x = \dots$ is

- (A) $\frac{\pi}{4}$ (B) $\frac{\pi}{2}$
(C) 1 (D) -1

Answer: - Option B

Explanation: - By complementary relation $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$

51. $\cos^{-1}(-x)$ is equal to?

- (A) $\cos^{-1}x$ (B) $\pi - \cos^{-1}x$
(C) $-\cos^{-1}x$ (D) $\pi + \cos^{-1}x$

Answer: - Option B

Explanation: - By negative relation $\cos^{-1}(-x) = \pi - \cos^{-1}x$.

52. Evaluate $\tan^{-1}\left(\frac{1}{7}\right) + \tan^{-1}\left(\frac{1}{13}\right) = \dots\dots$
- (A) $\tan^{-1}\left(\frac{2}{9}\right)$ (B) $\cot^{-1}\left(\frac{2}{9}\right)$
 (C) $\tan^{-1}\left(\frac{9}{2}\right)$ (D) $\tan^{-1}(1)$

Answer: - Option B

Explanation: - By using $\tan^{-1}(x) + \tan^{-1}(y) = \tan^{-1}\left(\frac{x+y}{1-xy}\right)$

53. Find the principal value of $\cos\left(\frac{\pi}{2} - \sin^{-1}\frac{1}{2}\right)$
- (A) $\frac{1}{2}$ (B) 1
 (C) 0 (D) $\frac{-1}{2}$

Answer: - Option A

Explanation: - Use $\cos\left(\frac{\pi}{2} - \theta\right) = \sin\theta$ and $\sin\sin^{-1}x = x$

54. Find the principal value of $\tan^{-1}\infty - \sin^{-1}\frac{1}{\sqrt{2}}$
- (A) $\frac{\pi}{4}$ (B) $\frac{2\pi}{3}$
 (C) π (D) $\frac{5\pi}{6}$

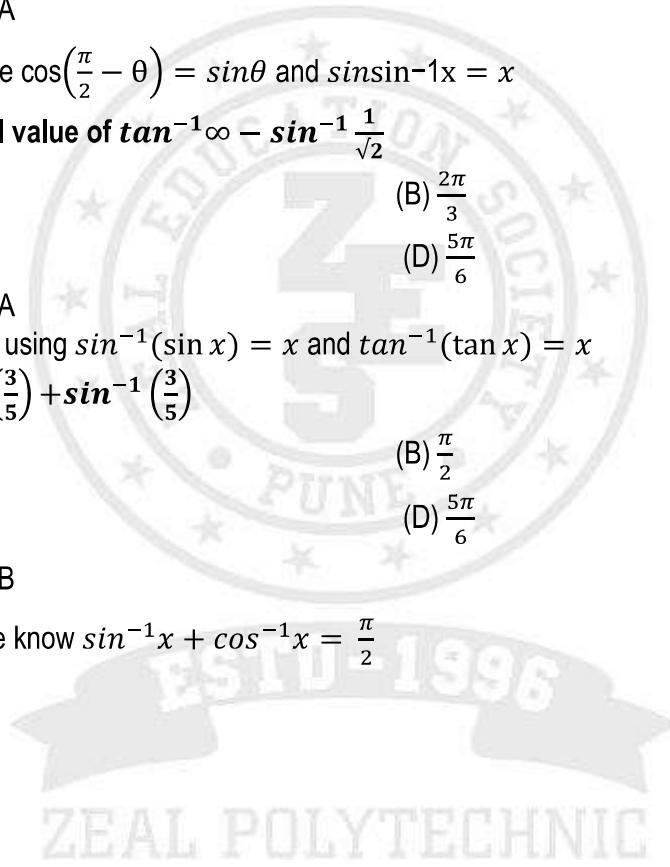
Answer: - Option A

Explanation: - By using $\sin^{-1}(\sin x) = x$ and $\tan^{-1}(\tan x) = x$

55. Evaluate $\cos^{-1}\left(\frac{3}{5}\right) + \sin^{-1}\left(\frac{3}{5}\right)$
- (A) $\frac{\pi}{3}$ (B) $\frac{\pi}{2}$
 (C) π (D) $\frac{5\pi}{6}$

Answer: - Option B

Explanation: - We know $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$



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Question Bank for Multiple Choice Questions

Program: All Programs in Diploma Engineering	Program Code: - CE/CO/ME/EE/EJ
Scheme: - I	Semester: - 1
Course: - Basic Mathematics	Course Code: - 22103

03 – Straight Line	Marks:-12
Content of Chapter:- 3.1 Straight line and slope of straight line. a. Angle between two lines b. Condition of parallel and perpendicular lines . 3.2 Various forms of straight lines. a. Slope point form, two point form b. Two points intercept form. c. General form. 3.2 Perpendicular distance from a point on the line. 3.3 Perpendicular distance between two parallel lines.	

1. **If the inclination of the line is 45° , then its slope is ...**
(A) 1 (B) 0
(C) -1 (D) -2

Answer: - Option A

Explanation:- Slope = $\tan(\theta)$

2. **The slope of y-axis is ...**
(A) 1 (B) 0
(C) 1 (D) Not Defined

Answer: - Option D

Explanation:- The angle made by Y-axis with the positive direction of X-axis is 90° .

3. **The slope of x-axis is**
(A) 1 (B) 0
(C) -1 (D) Not Defined

Answer: - Option B

Explanation: - Inclination of X-axis is 0°

4. The slope of the line $5x+3y+7=0$ is ...

- (A) $\frac{5}{3}$ (B) $\frac{3}{5}$
(C) $-\frac{5}{3}$ (D) $-\frac{3}{5}$

Answer: - Option C

Explanation: - Slope of line $ax+by+c=0$ is , $m = -\frac{a}{b}$

5. Two lines are parallel to each other is their slopes are ...

- (A) equal (B) not equal
(C) opposite (D) imaginary

Answer: - Option A

Explanation:- parallel lines slopes are equals.

6. The slope of line passing through origin and and the point (3, 4) is ...

- (A) $\frac{4}{3}$ (B) $-\frac{4}{3}$
(C) $\frac{3}{4}$ (D) $-\frac{3}{4}$

Answer: - Option A

Explanation: - By using formula , $m = \frac{y_2-y_1}{x_2-x_1}$

7. The y-intercept of line $5x-4y+7=0$ is ...

- (A) $\frac{5}{4}$ (B) $-\frac{5}{4}$
(C) $\frac{7}{4}$ (D) $-\frac{7}{4}$

Answer: - Option c

Explanation: - By using formula , $m = -\frac{c}{B}$

8. If the slope of line passing through the points (-1, -4) and (2, k) is -1 then k=...

- (A) 7 (B) 0
(C) -7 (D) -2

Answer: - Option C

Explanation: - By using formula , $m = \frac{y_2-y_1}{x_2-x_1}$

9. The lines $2x-y+1=0$ and $8x-4y-5=0$ are ...

- (A) perpendicular (B) parallel
(C) intersecting (D) none of these

Answer: - Option B

Explanation: - check $m_1 \cdot m_2 = -1$ or $m_1 = m_2$

10. The equation of line passing through the point (4, 1) and making an angle of 45° with positive direction of x-axis is ...

- (A) $x-y-3=0$ (B) $x+y-3=0$
(C) $x-y+3=0$ (D) $x+y+3=0$

Answer: - Option A

Explanation:- Slope intercept form of line is $y - y_1 = m(x - x_1)$

11. The line $2x+3y-1=0$ and $3x-2y-5=0$ are

- (A) perpendicular (B) parallel
(C) intersecting (D) none of these

Answer: - Option A

Explanation: - check $m_1 \cdot m_2 = -1$ or $m_1 = m_2$

12. The equation of line having slope 3 and making intercept 4 on y-axis is ...

- (A) $3x+y-3=0$ (B) $3x-y+4=0$
(C) $2x+y-3=0$ (D) $2x-y+3=0$

Answer: - Option B

Explanation:- Slope intercept form of line is $y=mx+c$

13. The equation of line whose slope is $\frac{-3}{2}$ and passing through the point (1, 2) is ...

- (A) $3x+2y-7=0$ (B) $3x-2y+7=0$
(C) $3x-2y-7=0$ (D) $3x-2y-5=0$

Answer: - Option A

Explanation: - The equation of line in slope intercept form is $y - y_1 = m(x - x_1)$

14. The equation of line passing through the points (3, 4) and (5, 6) is

- (A) $x+y-1=0$ (B) $x-y+1=0$
(C) $x-y-1=0$ (D) $x-y-2=0$

Answer: - Option B

Explanation: - The equation line in two point form is $\frac{y-y_1}{y_1-y_2} = \frac{x-x_1}{x_1-x_2}$

15. The equation of line whose x-intercept is 10 and y-intercept is 3 is given by

- (A) $3x+10y-30=0$ (B) $3x-10y-30=0$
(C) $3x-10y+30=0$ (D) $3x+10y+30=0$

Answer: - Option A

Explanation: - The equation line in in two intercept form is $\frac{x}{a} + \frac{y}{b} = 1$

16. The acute angle between the line $y=5x+6$ and $y=x$ is ...
- (A) $\tan^{-1}\left(\frac{2}{3}\right)$ (B) $\tan^{-1}\left(\frac{3}{2}\right)$
(C) $\tan^{-1}(1)$ (D) $\tan^{-1}(-1)$

Answer: - Option A

Explanation: - If is the acute angle between lines then $\tan\theta = \left| \frac{m_1 - m_2}{1 + m_1 m_2} \right|$

17. The distance of point (1, -1) from the straight line $3x-4y+8=0$ is
- (A) 3 unit (B) 4 unit
(C) 5 unit (D) 0 unit

Answer: - Option A

Explanation: - The distance of a point $P(x_1, y_1)$ from the line $ax+by+c=0$ is $\left| \frac{ax_1 + by_1 + c}{\sqrt{a^2 + b^2}} \right|$

18. The distance between the two parallel lines $6x+8y+10=0$ and $6x+8y-25=0$ is
- (A) $\frac{5}{2}$ (B) $\frac{7}{2}$
(C) $\frac{3}{2}$ (D) $\frac{1}{2}$

Answer: - Option B

Explanation: - Perpendicular distance between two parallel lines $ax + by + c_1 = 0$ and $ax + by + c_2 = 0$ is $\left| \frac{c_1 - c_2}{\sqrt{a^2 + b^2}} \right|$

19. Two lines are perpendicular to each other if product of their slope is equal to
- (A) 0 (B) 1
(C) -1 (D) none of these

Answer: - Option C

Explanation: - If two lines are perpendicular then $m_1 \cdot m_2 = -1$

20. If inclination of the line is ' θ ', then its slope is given by ...
- (A) $\sin\theta$ (B) $\cos\theta$
(C) $\tan\theta$ (D) $\cot\theta$

Answer: - Option C

Explanation: - Slope = $\tan(\theta)$

21. Slope of general line $ax+by+c=0$ is given by

(A) $\frac{a}{b}$

(B) $-\frac{a}{b}$

(C) $\frac{b}{a}$

(D) $-\frac{b}{a}$

Answer: - Option B

Explanation: - $\text{slope} = -\frac{\text{Coefficient of } x}{\text{coefficient of } y}$

22. The slope of line whose inclination is 0° is ...

(A) 0

(B) 1

(C) -1

(D) none of these

Answer: - Option A

Explanation: - Slope = $\text{Tan}(\theta)$

23. The equation of 'x-axis' is ...

(A) $x=0$

(B) $x=1$

(C) $y=0$

(D) $y=1$

Answer: - Option C

Explanation: - The y- coordinates on x-axis are zero.

24. The equation of 'y-axis' is

(A) $x=0$

(B) $x=1$

(C) $y=0$

(D) $y=1$

Answer: - Option A

Explanation: - The X- coordinates on Y-axis are zero

25. The point of intersection of the lines $4x+3y=8$ and $x+y=1$ is

(A) (5, 4)

(B) (4, 5)

(C) (-5, 4)

(D) (5, -4)

Answer: - Option D

Explanation: - Solve these simultaneous equations.

26. Let lines 'L₁' and 'L₂' are perpendicular to each other. If slope of line L₁ is $\frac{4}{5}$, then slope of line L₂ is

...

(A) $\frac{5}{4}$

(B) $-\frac{5}{4}$

(C) $-\frac{4}{5}$

(D) none of these

Answer: - Option B

Explanation: - If two lines are perpendicular then $m_1 \cdot m_2 = -1$

27. Let lines 'L₁' and 'L₂' are parallel to each other. If slope of line L₁ is 1, then slope of line L₂ is ...

(A) 0

(B) 1

(C) -1

(D) not defined

Answer: - Option B

Explanation: - If the lines are parallel then slopes are equal.

28. Equation of the line passing through point (-3, -5) and perpendicular to y-axis is ...

- (A) 0 (B) 1
 (C) -1 (D) none of these

Answer: - Option C

Explanation: - The equation of line in slope intercept form is $y - y_1 = m(x - x_1)$

29. **The area of the triangle whose vertices are (3,1), (-1,3) and (-3,-2)**

- (A) 12 sq. Unit (B) 28 sq. Unit
 (C) 11 sq. Unit (D) 21.5 sq. Unit

Answer: - Option A

Explanation: - we can find the area of the triangle by using formula $\frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$

30. **Which of the following points are collinear**

- (A) (2,3),(-1,0) and (4,5) (B) (3,1),(-1,3) and (-3,4)
 (C) (3,5),(3,-2) and (-3,16) (D) None of the above

Answer: - Option A

Explanation: - The condition of collinearity is $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$

31. **The value of x if the points (-5,7), (x,5) and (2,-7) are collinear**

- (A) x=0 (B) x=-3
 (C) x=-1 (D) x=2

Answer: - Option B

Explanation: - The condition of collinearity is $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0$

32. **The length of the perpendicular from the point (1,6) on the line $x+y+8=0$**

- (A) $\frac{15}{\sqrt{2}}$ (B) $\frac{15}{\sqrt{3}}$
 (C) $\frac{15}{\sqrt{4}}$ (D) $\frac{15}{\sqrt{8}}$

Answer: - Option A

Explanation: - The distance of a point $P(x_1, y_1)$ from the line $ax+by+c=0$ is $\left| \frac{ax_1+by_1+c}{\sqrt{a^2+b^2}} \right|$

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04 – Mensuration

Marks:- 08

Content of Chapter:-

4.1 Area of regular closed figures, Area of triangle, square, parallelogram, rhombus, trapezium and circle.

4.2 Volume of cuboids, cone, cylinder and sphere.

1. **Area of the triangle when base is b and height is h is _____.**

(A) $\text{Area} = \frac{1}{2} \times b \times h$

(B) $\text{Area} = b \times h$

(C) $\text{Area} = b^2$

(D) $\text{Area} = h^2$

Answer: - Option A

Explanation: - According to Formula: $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$.

2. **Area of an equilateral triangle is _____.**

(A) $\text{Area} = b \times h$

(B) $\text{Area} = \frac{\sqrt{3}}{4} \times (\text{side})^4$

(C) $\text{Area} = (\text{side})^2$

(D) $\text{Area} = \frac{\sqrt{3}}{4} \times (\text{side})^2$

Answer: - Option D

Explanation: - According to Formula: $\text{Area} = \frac{\sqrt{3}}{4} \times (\text{side})^2$

3. **Area of rectangle is _____.**

(A) $\text{Area} = \text{base} \times \text{height}$

(B) $\text{Area} = \text{length} \times \text{breadth}$

(C) $\text{Area} = \text{base} \times \text{length}$

(D) $\text{Area} = \text{length} \times \text{heighth}$

Answer: - Option B

Explanation: - According to Formula: $\text{Area of rectangle} = \text{length} \times \text{breadth}$

4. **Area of square is _____.**

(A) $\text{Area} = \text{side}^4$

(B) $\text{Area} = \text{side} \times \text{side}$

(C) $\text{Area} = \text{side}^3$

(D) $\text{Area} = \text{side}^5$

Answer: - Option B

Explanation: - According to Formula: $\text{Area} = \text{length} \times \text{breadth}$

5. Area of rhombus is _____.

(A) Area = $\frac{1}{2} \times b \times h$

(B) Area = side \times side

(C) Area = $\frac{1}{2} \times d_1 \times d_2$

(D) Area = $b \times h$

Answer: - Option C

Explanation: - According to Formula: Area = $\frac{1}{2} \times$ Product of diagonals, where d_1 & d_2 are diagonals.

6. Area of parallelogram when base is 'b' and height is 'h' is _____.

(A) Area = $b \times h$

(B) Area = $\frac{1}{2} \times b \times h$

(C) Area = $\frac{\sqrt{3}}{4} \times (\text{side})^2$

(D) Area = $(\text{side})^2$

Answer: - Option A

Explanation: - According to Formula: Area = base \times height

7. If 'r' is the radius of circle, then area of circle is _____.

(A) Area = $2\pi r$

(B) Area = $\frac{d}{2}$, where 'd' is the diameter

(C) Area = $2r$

(D) Area = πr^2

Answer: - Option D

Explanation: - According to Formula: Area = $\pi \times (\text{radius})^2$

8. Area of Trapezium is _____.

(A) Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

(B) Area = sum of parallel sides \times height

(C) Area = $\frac{1}{2} \times (\text{sum of parallel sides})$

(D) Area = $\frac{1}{2} \times (\text{sum of parallel sides}) + \text{height}$

Answer: - Option A

Explanation: - According to Formula: Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

9. If 'R' and 'r' be radius of outer and inner circles, then area of annulus (ring) is _____

(A) Area = $\pi r^2 - \pi R^2$

(B) Area = $\pi R^2 - \pi r^2$

(C) Area = $\pi r^2 = \pi R^2$

(D) Area = $\pi r^2 + \pi R^2$

Answer: - Option B

Explanation: - According to Formula: Area = Area of outer circle – Area of inner circle

10. The area of rectangle with one side 8 cm is 172 cm^2 . Find length of the other side

(A) 26 cm

(B) 30 cm

(C) 21.5 cm

(D) 72 cm

Answer: - Option C

Explanation: - According to Formula: Area = length \times breadth

11. The area of rhombus whose diagonals are of length 10cm and 8.2 cm.

- (A) 26 sq.cm (B) 41 sq. cm
(C) 210 sq. cm (D) 82 sq.cm

Answer: - Option B

Explanation: - According to Formula: Area = $\frac{1}{2} \times d_1 \times d_2$

12. The area of the circle whose radius is 7.7 cm.

- (A) 126.5 cm² (B) 130.4 cm²
(C) 121.5 cm² (D) 186.34 cm²

Answer: - Option D

Explanation: - According to Formula: Area = πr^2

13. If the area of circle is 120 cm², then radius of a circle is _____.

- (A) r = 6.18 cm (B) r = 8.18 cm
(C) r = 9.18 cm (D) r = 4.18 cm

Answer: - Option A

Explanation: - According to Formula: Area = πr^2

14. A circle has a diameter of 14cm. Then its area is _____.

- (A) 164 sq.cm (B) 174 sq.cm
(C) 154 sq.cm (D) 184 sq.cm

Answer: - Option D

Explanation: - According to Formula: Area = πr^2

15. The area of a trapezium whose parallel sides are 10 cm and 8cm where the perpendicular distance between the sides is 4cm is _____.

- (A) A = 64 sq.cm (B) A = 74 sq.cm
(C) A = 54 sq.cm (D) A = 36 sq.cm

Answer: - Option D

Explanation: - According to Formula: Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

16. A wall is of the form of a trapezium with height 4 m and parallel sides being 3m and 5m then the cost of painting the wall if it has rate of painting as Rs. 25 per sq. m

- (A) 220 Rs (B) 280 Rs
(C) 240 Rs (D) 260 Rs.

Answer: - Option C

Explanation: - According to Formula: Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

17. The area of a trapezoid with base of 10cms and 14cms and height of 5cms.

(A) 60 sq.cm

(B) 70 sq.cm

(C) 50 sq.cm

(D) 30 sq.cm

Answer: - Option A

Explanation: - According to Formula: Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

18. The area of trapezoid is 24 sq.cm and the bases are 9cms and 7cms then the height is_____.

(A) h = 4cm

(B) h = 3cm

(C) h = 5cm

(D) h = 6cm

Answer: - Option B

Explanation: - According to Formula: Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

19. The area of a rectangular garden is $3000m^2$ Its sides are in the ratio 6:5. Then the perimeter of the garden is_____.

(A) 220 m

(B) 240 m

(C) 260 m

(D) 280 m

Answer: - Option A

Explanation: - According to Formula: Area = length \times breadth

20. The circumference of circle whose area is 38.5 cm^2 .

(A) 22 cm

(B) 24 cm

(C) 26 cm

(D) 28cm

Answer: - Option A

Explanation: - According to Formula: Area = πr^2 , Circumference = $2 \pi r$

21. Find the area of triangular plot whose base is 17.2 cm and height 19.60 cm.

(A) 126.5 cm^2

(B) 130.4 cm^2

(C) 168.56 cm^2

(D) 186.34 cm^2

Answer: - Option C

Explanation: - According to Formula: Area = base \times height.

22. The of a right-angled triangle is 8m and hypotenuse is 100m. Find its area.

(A) 48 m^2

(B) 24 m^2

(C) 21 m^2

(D) 34 m^2

Answer: - Option B

Explanation: - According to Formula: Area = base \times height

23. A park is in the form of a right-angled triangle with hypotenuse 13m. If one of the side is 12 m, find the cost of leveling at the rate of Rs. 10 per sq. m.

- (A) Rs. 30 (B) Rs.60
(C) Rs. 250 (D) Rs. 300

Answer: - Option D

Explanation: - According to Formula: Area = base \times height

24. Find the area of triangle whose sides are 4cm, 6cm and 8cm.

- (A) 135 cm² (B) 130.4 cm²
(C) 11.5 cm² (D) 11.62 cm²

Answer: - Option D

Explanation: - Using Heron's to Formula: Area = $\sqrt{s(s-a)(s-b)(s-c)}$

25. Find the area of triangle if a = 51 cm, b = 70cm and $\angle C = 41^\circ$.

- (A) 1117.51 cm² (B) 1304.4 cm²
(C) 1171.07 cm² (D) 1816.34 cm²

Answer: - Option C

Explanation: - According to Formula: Area = $\frac{1}{2} \times a \cdot b \times \sin C$

26. The area of an Equilateral triangle is $\sqrt{3}$ cm². Find its height.

- (A) 18 cm (B) $9\sqrt{3}$ cm
(C) $3\sqrt{3}$ cm (D) $\sqrt{3}$ cm

Answer: - Option B

Explanation: - According to Formula: Altitude of equilateral triangle = $\frac{\sqrt{3}}{2} \times \text{side}$

27. The adjacent sides of a parallelogram are 10 cm and 8 cm, one of the diagonal is 6cm. Find the area of the parallelogram.

- (A) 12 cm² (B) 24 cm²
(C) 21 cm² (D) 48 cm²

Answer: - Option D

Explanation: - According to Formula: Area = $\sqrt{s(s-a)(s-b)(s-c)}$

28. A square grassy plot is of side 100 meters. It has gravel path 10 meters wide all around it on the inside. Find the area of the path.

- (A) 3600 m² (B) 1304 m²
(C) 1215 m² (D) 1864 m²

Answer: - Option A

Explanation: - According to Formula: Area of rectangle = length \times breadth

29. The side of square shaped field is 170m long. Find the cost of leveling the field at the rate of Rs. 1.20 per m².

(A) Rs. 28900

(B) Rs. 4680

(C) Rs. 34680

(D) Rs. 18634

Answer: - Option C

Explanation: - According to Formula: Area = (side)²

30. In exchange for a square plot of land, one of whose side is 25 meters, a man want to buy a rectangular plot of 50 meters wide and of the same area as the square plot. Determine the length of the rectangular plot.

(A) L = 12 meters

(B) L = 12.5 meters

(C) L = 27 meters

(D) L = 11.5 meters

Answer: - Option B

Explanation: - According to Formula: Area of rectangle = length × breadth.

Area of square = (side)²

31. Find the area of rhombus whose diagonals are 6cm and 9cm.

(A) A = 54 cm²

(B) A = 45 cm²

(C) A = 27 cm²

(D) A = 15 cm²

Answer: - Option C

Explanation: - According to Formula: Area = $\frac{1}{2} \times d_1 \times d_2$

32. Area of rhombus is 336cm² and one diagonal is 14cm. Find the length of side.

(A) side = 25cm

(B) side = 48cm

(C) side = 52cm

(D) side = 62cm

Answer: - Option A

Explanation: - According to Formula: Side of rhombus = $\frac{1}{2} \sqrt{d_1^2 + d_2^2}$

33. Find the area of rhombus if its side is 13cm and one of its diagonal is 10cm.

(A) Area = 12 cm²

(B) Area = 240 cm²

(C) Area = 270 cm²

(D) Area = 120 cm²

Answer: - Option D

Explanation: - According to Formula: Area = $\frac{1}{2} \times d_1 \times d_2$ and Side of rhombus = $\frac{1}{2} \sqrt{d_1^2 + d_2^2}$

34. The two parallel sides of a trapezium measures 50m and 20m respectively and altitude is 50m. Find the area.

(A) Area = 70 m²

(B) Area = 1240 m²

(C) Area = 1750 m²

(D) Area = 1120 m²

Answer: - Option D

Explanation: - According to Formula: Area = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

35. If sum of two parallel sides of a trapezium is 232cm and its area is 928 cm². Find its altitude.

(A) $h = 12 \text{ cm}$

(B) $h = 8 \text{ cm}$

(C) $h = 2 \text{ cm}$

(D) $h = 16 \text{ cm}$

Answer: - Option B

Explanation: - According to Formula: $\text{Area} = \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

36. The two parallel sides of a trapezium measures 58m and 42m respectively. The other two Sides are equal each being 17m. Find its area.

(A) $\text{Area} = 750 \text{ m}^2$

(B) $\text{Area} = 240 \text{ m}^2$

(C) $\text{Area} = 270 \text{ m}^2$

(D) $\text{Area} = 120 \text{ m}^2$

Answer: - Option A

Explanation: - According to Formula: $\text{Area} = \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$ and Pythagoras theorem.

37. Volume of Cuboid is _____.

(A) $\text{Volume} = l \times b \times h$ cubic units.

(B) $\text{Volume} = l \times b$ cubic units.

(C) $\text{Volume} = l \times h$ cubic units.

(D) $\text{Volume} = b \times h$ cubic units.

Answer: - Option A

Explanation: - According to Formula: $\text{Volume} = l \times b \times h$ cubic units.

38. Let 'l', 'b' and 'h' are the length, breadth and height respectively, then total surface area is _____.

(A) $\text{Surface Area} = 2 (lb + bh)$

(B) $\text{Surface Area} = 2 (lh + bh)$

(C) $\text{Surface Area} = 2 (lb + lh)$

(D) $\text{Surface Area} = 2 (lb + bh + lh)$

Answer: - Option D

Explanation: - According to Formula: $\text{Surface Area of cuboid} = 2 (lb + bh + lh)$

39. Let 'l', 'b' and 'h' are the length, breadth and height respectively, then the diagonal of cuboid is _____.

(A) $\text{Diagonal} = \sqrt{l^2 + b^2}$

(B) $\text{Diagonal} = l^2 + b^2 + h^2$

(C) $\text{Diagonal} = \sqrt{l^2 + b^2 + h^2}$

(D) $\text{Diagonal} = \sqrt{l + b + h}$

Answer: - Option C

Explanation: - According to Formula: $\text{Diagonal of cuboid} = \sqrt{l^2 + b^2 + h^2}$

40. Volume of cube is _____.

(A) $\text{Volume} = (\text{side})^3$.

(B) $\text{Volume} = (\text{side})^2$.

(C) $\text{Volume} = \text{side}$

(D) $\text{Volume} = \text{length} \times \text{breadth}$

Answer: - Option A

Explanation: - According to Formula: $\text{Volume} = (\text{side})^3$

41. Surface area of cube is _____

(A) Surface Area = (side)²

(B) Surface Area = 2 (side)²

(C) Surface Area = 6 (side)²

(D) Surface Area = 6 (side)

Answer: - Option C

Explanation: - According to Formula: Surface Area of cube = 6 (side)²

42. Diagonal of cube is _____.

(A) Diagonal of cube = $\sqrt{3}$ (side)²

(B) Diagonal of cube = $\sqrt{3}$ (side)

(C) Diagonal of cube = $\sqrt{3}$ (side)³

(D) Diagonal of cube = $\sqrt{6}$ (side)²

Answer: - Option B

Explanation: - According to Formula: Diagonal of cube = $\sqrt{3}$ (side)

43. If 'r' is the radius of cylinder and 'h' is the height of cylinder, then volume is _____.

(A) Volume = $\pi r^2 h$

(B) Volume = $2\pi r h$

(C) Volume = πr^2

(D) Volume = $r^2 h$

Answer: - Option A

Explanation: - According to Formula: Volume of cylinder = $\pi r^2 h$

44. If 'r' is the radius of cylinder and 'h' is the height of cylinder, then curved surface area is _____.

(A) Curved Surface Area = $\pi r^2 h$

(B) Curved Surface Area = $2\pi r h$

(C) Curved Surface Area = πr^2

(D) Curved Surface Area = $r^2 h$

Answer: - Option B

Explanation: - According to Formula: Curved Surface Area of cylinder = $2\pi r h$

45. If 'r' is the radius of cylinder and 'h' is the height of cylinder, then total surface area is _____.

(A) Total Surface Area = $2\pi r (r + h)$

(B) Total Surface Area = $\pi r h$

(C) Total Surface Area = $2\pi (r + h)$

(D) Total Surface Area = $2r (r + h)$

Answer: - Option A

Explanation: - According to Formula: Total Surface Area of cylinder = $2\pi r (r + h)$

46. If 'r', 'h' and 'l' is the radius, height and slant height of right circular cone respectively, then volume is _____.

(A) Volume = $\pi r^2 h$

(B) Volume = $2\pi r h l$

(C) Volume = $\frac{1}{3} \pi r^2 h$

(D) Volume = $r^2 h l$

Answer: - Option C

Explanation: - According to Formula: Volume of cone = $\frac{1}{3} \pi r^2 h$

47. If 'r', 'h' and 'l' is the radius, height and slant height of right circular cone respectively, then curved surface area is_____.

- (A) Curved Surface Area = $\pi r^2 l$ (B) Curved Surface Area = $2\pi r l$
(C) Curved Surface Area = πr^2 (D) Curved Surface Area = $\pi r l$

Answer: - Option D

Explanation: - According to Formula: Curved Surface Area of cone = $\pi r l$

48. If 'r', 'h' and 'l' is the radius, height and slant height of right circular cone respectively, then Total surface area is_____.

- (A) Total Surface Area = $\pi r(r + h)$ (B) Total Surface Area = $\pi r l$
(C) Total Surface Area = $2\pi(r + l)$ (D) Total Surface Area = $\pi r(r + l)$

Answer: - Option D

Explanation: - According to Formula: Total Surface Area of cone = $\pi r(r + l)$

49. If 'r', 'h' and 'l' is the radius, height and slant height of right circular cone respectively, then slant height $l =$ _____.

- (A) Slant Height (l) = $\sqrt{h^2 + l^2}$ (B) Slant Height (l) = $\sqrt{h^2 + r^2}$
(C) Slant Height (l) = $\sqrt{h^2 - l^2}$ (D) Slant Height (l) = $\sqrt{h^2 - r^2}$

Answer: - Option B

Explanation: - According to Formula: Slant Height (l) = $\sqrt{h^2 + r^2}$

50. Volume of Sphere is_____.

- (A) Volume = $\frac{4}{3}\pi r^3$ (B) Volume = $2\pi r$
(C) Volume = $\frac{4}{3}\pi r^2$ (D) Volume = πr^2

Answer: - Option A

Explanation: - According to Formula: Volume of sphere = $\frac{4}{3}\pi r^3$

51. Surface Area of Sphere is_____.

- (A) Surface Area = πr^2 (B) Surface Area = $2\pi r$
(C) Surface Area = $4\pi r^2$ (D) Surface Area = $\frac{4}{3}\pi r^2$

Answer: - Option C

Explanation: - According to Formula: Surface Area of Sphere = $4\pi r^2$

52. Volume of Hemisphere is_____.

- (A) Volume = $\frac{4}{3}\pi r^3$ (B) Volume = $2\pi r$
(C) Volume = $\frac{4}{3}\pi r^2$ (D) Volume = $\frac{2}{3}\pi r^3$

Answer: - Option D

Explanation: - According to Formula: Volume of Hemisphere = $\frac{2}{3}\pi r^3$

53. **Curved Surface Area of Hemisphere is_____.**

(A) Curved Surface Area = πr^2

(B) Curved Surface Area = πr^2

(C) Curved Surface Area = $2 \pi r^2$

(D) Curved Surface Area = $4 \pi r^2$

Answer: - Option B

Explanation: - According to Formula: Curved Surface Area of Sphere = $2 \pi r^2$

54. **Total Surface Area of Hemisphere is_____.**

(A) Total Surface Area = πr^2

(A) Total Surface Area = r^2

(C) Total Surface Area = $2 \pi r^2$

(D) Total Surface Area = $3 \pi r^2$

Answer: - Option D

Explanation: - According to Formula: Total Surface Area = $3 \pi r^2$

55. **Find the Volume of Cuboid if the length, breadth and height are 25cm, 51cm, and 52cm respectively.**

(A) 66300 cm^3

(B) 6300 cm^3

(C) 36300 cm^3

(D) 65300 cm^3

Answer: - Option A

Explanation: - According to Formula: Volume = $l \times b \times h$

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05 – Statistics

Marks: - 14

Content of Chapter:-

- 5.1 Range, coefficient of range of discrete and grouped data.
- 5.2 Mean deviation and standard deviation from mean of grouped and ungrouped data, weighted means.
- 5.3 Variance and coefficient of variance.
- 5.4 Comparison of two sets of observation.

1. The distribution 3, 5, 7, 8, 3, 9, 5, 7, 10 is _____

- (A) Grouped data
- (B) Ungrouped data
- (C) Raw data
- (D) None of these

Answer: - Option C

Explanation: - According to definition of Raw data.

2. The following data is -----type.

Marks	3 - 5	5 - 7	7 - 9	9 - 11	11 - 13
No. of students	4	3	10	12	7

- (A) Grouped data
- (B) Ungrouped data
- (C) Raw data
- (D) None of these

Answer: - Option A

Explanation: - According to definition of Grouped data.

3. The following data is -----type.

Wt. of items in gms	50	100	150	200	250
No. of items	4	10	15	20	7

- (A) Grouped data
- (B) Ungrouped data
- (C) Raw data
- (D) None of these

Answer: - Option B

Explanation: - According to definition of Ungrouped data.

4. The 5 is the frequency of _____ observation from the data 1.2, 1.21, 1.5, 1.2, 1.5, 1.4, 1.41, 1.21, 1.5, 1.2, 1.8, 1.7, 1.8, 1.81, 1.4, 1.5, 1.2, 1.6, 1.7, 1.5, 1.8, 1.31, 1.2, 1.2.

- (A) 1.8
- (B) 1.2
- (C) 1.5
- (D) 1.21

Answer: - Option C

Explanation: - Frequency means number of occurrence (or number of repetitions) of observation in the given data. Here 1.5 is repeated 5 times, so 5 is the frequency of 1.5.

5. The correct formula to find class-mark for grouped frequency distribution is _____.

- (A) $\frac{\text{Upper limit} - \text{Lower limit}}{2}$ (B) $\frac{\text{Lower limit} - \text{Upper limit}}{2}$
(C) $\frac{\text{Upper limit} + \text{Lower limit}}{2}$ (D) None of these

Answer: - Option C

Explanation: - Class marks is the average of upper and lower limit of the class interval.

6. The correct formula for class length of grouped frequency distribution is _____

- (A) U. L + L. L (B) $\frac{L.L - U.L}{2}$
(C) $\frac{L.L + U.L}{2}$ (D) U. L - L. L

Answer: - Option D

Explanation: - According to definition of class length.

7. _____ is the relative measure.

- (A) Variance (B) Standard deviation
(C) Range (D) Mean Deviation

Answer: - Option A

Explanation: - According to definition of Variance.

8. _____ is the absolute measure.

- (A) Variance (B) Standard deviation
(C) Range (D) Mean Deviation

Answer: - Option B

Explanation: - According to definition of Standard deviation.

9. Range of the distribution is given by _____

- (A) L - S (B) L + S
(C) $\frac{L + S}{L - S}$ (D) $\frac{L - S}{L + S}$

Answer: - Option A

Explanation: - According to definition of range.

10. Coefficient of Range = _____

- (A) $\frac{\text{Range}}{L - S}$ (B) $\frac{L + S}{L - S}$
(C) L + S (D) $\frac{L - S}{L + S}$

Answer: - Option D

Explanation: - According to formula.

11. $\frac{\text{Range}}{L - S} = \underline{\hspace{2cm}}$

- (A) 1 (B) Range
(C) -1 (D) 0

Answer: - Option A

Explanation: - According to formula.

12. **Coefficient of Range** = $\underline{\hspace{2cm}}$

- (A) $\frac{L + S}{L - S}$ (B) $\frac{\text{Range}}{L - S}$
(C) $\frac{\text{Range}}{\text{Range} + 2s}$ (D) $\frac{\text{Range}}{\text{Range} + s}$

Answer: - Option C

Explanation: - According to formula.

13. **The Range of 10, 5, 12, 2, 15, 20, 8, 10 is** $\underline{\hspace{2cm}}$.

- (A) 18 (B) 22
(C) 20 (D) 2

Answer: - Option A

Explanation: - According to formula $L - S$

14. **The Range and coefficient of Range of the data 120, 100, 130, 50, 150 are** $\underline{\hspace{2cm}}$ respectively.

- (A) 5.5, 50 (B) 50, 0.5
(C) 2, 100 (D) 100, 0.5

Answer: - Option D

Explanation: - According to formula $\text{Range} = L - S$ and $\text{Coefficient of Range} = \frac{L - S}{L + S}$

15. **The class marks of a certain frequency distribution are 15, 25, 35, 45, 55, 65 then the range =** $\underline{\hspace{2cm}}$.

- (A) 25 (B) 50
(C) 55 (D) 65

Answer: - Option B

Explanation: - According to formula $\text{Range} = L - S$.

16. **The Range and coefficient of Range of 5, 7, 9, 13, 11, 5, 3 are** $\underline{\hspace{2cm}}$.

- (A) 5, 11 (B) 10, 0.61
(C) 10, 0.625 (D) 5, 0.5

Answer: - Option C

Explanation: - According to formula $\text{Range} = L - S$ and $\text{Coefficient of Range} = \frac{L - S}{L + S}$

17. The coefficient of Range of 50, 90, 120, 40, 180, 200, 80 is _____.

- (A) 0.60 (B) 0.69
(C) 0.65 (D) 0.67

Answer: - Option D

Explanation: - According to formula Coefficient of Range = $\frac{L - S}{L + S}$

18. The Range of the following distribution is _____.

x_i	3	8	13	18	23	28	33
f_i	1	4	5	7	2	3	10

- (A) 30 (B) 36
(C) 11 (D) 9

Answer: - Option A

Explanation: - According to formula Range = L – S.

19. The Range and coefficient of Range of the following distribution are _____.

Marks	5	15	25	35	45	55
No. of students	10	20	30	40	50	60

- (A) 50, 0.7142 (B) 50, 0.833
(C) 55, 0.833 (D) 55, 0.7142

Answer: - Option B

Explanation: - According to formula Range = L – S and Coefficient of Range = $\frac{L - S}{L + S}$

20. The Range and coefficient of Range of the following distribution are _____.

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
No. of students	10	20	15	25	30	25

- (A) 60, 0 (B) 15, 0.4285
(C) 60, 1 (D) None of these

Answer: - Option C

Explanation: - According to formula Range = L – S and Coefficient of Range = $\frac{L - S}{L + S}$

21. The Range of the following distribution is _____.

Max Temp	25 - 26	27 - 28	29 - 30	31 - 32	33 - 34	35 - 36
No. of Days	2	11	12	10	4	1

- (A) 12 (B) 11
(C) 13 (D) 10

Answer: - Option A

Explanation: - According to formula Range L – S.

22. The Range and coefficient of Range of the following distribution are _____.

Marks	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69
No. of students	6	10	16	14	8	4

(A) 59, 0.7468

(B) 60, 0.76

(C) 58, 0.76

(D) 59, 0.716

Answer: - Option B

Explanation: - According to formula Range = L – S and Coefficient of Range = $\frac{L - S}{L + S}$

23. In two factories A and B engaged in the same industrial area, the average weekly wages and the S.D. are as follows.

Factory	Average wages	Standard Deviation
A	34.5	5.0
B	28.5	4.5

Which factory A or B is more consistent?

(A) Factory A

(B) Factory B

(C) Both A and B

(D) None of these

Answer: - Option A

Explanation: - According to formula c.v. = $\frac{\sigma}{\bar{X}} \times 100$, c.v. of A < c. v. of B.

24. Find standard deviation of the following data 6, 7, 10, 12, 13, 4, 8, 12.

(A) 4.04

(B) 3.04

(C) 5.04

(D) 6.04

Answer: - Option B

Explanation: - According to formula S.D. = $\frac{\sqrt{(x_i - \bar{X})^2}}{n}$

25. Find standard deviation of the following data 12, 6, 7, 3, 15, 10, 18, 5.

(A) 4.87

(B) 3.87

(C) 5.87

(D) 6.87

Answer: - Option A

Explanation: - According to formula S.D. = $\frac{\sqrt{(x_i - \bar{X})^2}}{n}$

26. The class marks of a certain frequency distribution are 15, 25, 35, 45, 55, 65 then the range = ____.

(A) 25

(B) 50

(C) 55

(D) 65

Answer: - Option B

Explanation: - According to formula Range L – S.

27. The class marks of a certain frequency distribution are 15, 25, 35, 45, 55, 65 then the range = ____.

(A) 25

(B) 50

(C) 55

(D) 65

Answer: - Option B

Explanation: - According to formula Range $L - S$.

28. The class marks of a certain frequency distribution are 15, 25, 35, 45, 55, 65 then the range = ____.

(A) 25

(B) 50

(C) 55

(D) 65

Answer: - Option B

Explanation: - According to formula Range $L - S$.

29. The class marks of a certain frequency distribution are 15, 25, 35, 45, 55, 65 then the range = ____.

(A) 25

(B) 50

(C) 55

(D) 65

Answer: - Option B

Explanation: - According to formula Range $L - S$.

30. The class marks of a certain frequency distribution are 15, 25, 35, 45, 55, 65 then the range = ____.

(A) 25

(B) 50

(C) 55

(D) 65

Answer: - Option B

Explanation: - According to formula Range $L - S$.

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