Graphic Era HILL UNIVERSITY
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End Term (Odd) Semester Examination November 2025

Roll no.....

Name of the Course : BCA / BCA AI & DS / BCA CS & CL
Semester: 1
Name of the Paper: Basic Mathematics-I(Bridge Course)
Paper Code: BBC 111/ TBC111

Time: 3 hour | Maximum Marks: 100

Note:

(i) All the questions are compulsory.
(ii) This paper contain 50 questions each question carry 2 marks.

1. What is the cardinality of the set {p, q, r, s}
   (a) 1
   (b) 2
   (c) 3
   (d) 4

2. If A={1, 2, 3}and B={3, 4, 5}, then A∩B = ?
   (a) {1, 2, 3, 4, 5}
   (b) {3}
   (c) {1, 2}
   (d) {4, 5}

3. The number of subsets of the set {a, b, c, d} is:
   (a) 4
   (b) 8
   (c) 12
   (d) 16

4. Which of the following is an irrational number?
   (a) $\sqrt{2}$
   (b) 0.25
   (c) 5
   (d) 0.75

5. Which of the following statements is true?
   (a) Every integer is a natural number.
   (b) Every natural number is an integer.
   (c) Every integer is a whole number.
   (d) Every rational number is an integer.

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6. Which number is not a rational number?
   (a) $\sqrt{5}$
   (b) 0.33
   (c) 3/4
   (d) -4

7. If A={1, 2, 3}, B={3, 4, 5}, then AUB = ?
   (a) {1, 2, 3, 4, 5}
   (b) {3}
   (c) {1,2, 4, 5}
   (d) {1, 2, 5}

8. If U={1, 2, 3, 4, 5, 6, 7, 8} and A={2, 4, 6, 8}, then A′ =?
   (a) {1, 3, 5, 7}
   (b) {2, 4, 6, 8}
   (c) {3, 5, 7, 9}
   (d) {1, 2, 3, 4}

9. If A = {a, b, c, d}and B ={c, d, e}, find A – B.
   (a) {a, b, c, d, e}
   (b) {c}
   (c) {a, b}
   (d) {d, e}

10. If A⊂B, then:
    (a) Every element of B is in A.
    (b) Every element of A is in B.
    (c) A and B have no elements in common.
    (d) A = B.

11. Cos(A + B) is equal to
    (a) sin A. cos B – cos A. sin B
    (b) sin A. cos B + cos A. sin B
    (c) sin A. sin B + cos A. cos B
    (d) sin A. sin B – cos A. cos B

12. Tan (90+A) is equal to
    (a) Tan A
    (b) –Tan A
    (c) Cot A
    (d) – Cot A

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13. Value of Tan 45° is
    (a) 1
    (b) 1/2
    (c) -1
    (d) 0

14. If $\sin A = \frac{3}{5}$, find $\tan A$.
    (a) $\frac{3}{4}$
    (b) $\frac{4}{3}$
    (c) $\frac{5}{3}$
    (d) $\frac{3}{5}$

15. $\sec\theta$ is the reciprocal of:
    (a) $\sin\theta$
    (b) $\cos\theta$
    (c) $\tan\theta$
    (d) $\cot\theta$

16. Which relation between Sin A, Cos A is correct
    (a) $\sin^2 A + \cos^2 A = 1$
    (b) $\sin^2 A - \cos^2 A = 1$
    (c) $\cos^2 A - \sin^2 A = 1$
    (d) $\cos^2 A = \sin^2 A$

17. cos (360+A) is equal to
    (a) SinA
    (b) –SinA
    (c) cosA
    (d) -cosA

18. If $\tan A = \frac{1}{\sqrt{3}}$, then the value of A is:
    (a) 45°
    (b) 30°
    (c) 60°
    (d) 90°

19. If $\sin A = \frac{3}{5}$, then $\sin 2A$ =?
    (a) $\frac{12}{25}$
    (b) $\frac{24}{25}$

(c) $\frac{7}{25}$
(d) $\frac{3}{4}$

20. The value of sin 30°is:

(a) 0
(b) 1
(c) $\frac{1}{2}$
(d) $\frac{\sqrt{3}}{2}$

21. A matrix with equal number of rows and columns is called a:
(a) Diagonal matrix
(b) Square matrix
(c) Rectangular matrix
(d) Null matrix

22. If A = [0], then A is called a:
(a) Unit matrix
(b) Null matrix
(c) Identity matrix
(d) Square matrix

23. If A and B are two matrices such that AB is defined, then:
(a) Columns of A = Rows of B
(b) Rows of A = Columns of B
(c) Order of A = Order of B
(d) None

24. The determinant of $\begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$ is:
(a) 5
(b) 2
(c) 11
(d) 8

25. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$, then A + B =?
(a) $\begin{bmatrix} 5 & 5 \\ 5 & 5 \end{bmatrix}$
(b) $\begin{bmatrix} 5 & 5 \\ 6 & 5 \end{bmatrix}$
(c) $\begin{bmatrix} 3 & 5 \\ 5 & 3 \end{bmatrix}$
(d) $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

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26. The inverse of A is:

(a) $\frac{1}{|2A|} adj\ A$

(b) $\frac{1}{|A|} adj\ A$

(c) $-\frac{1}{|A|} adj\ A$

(d) $\frac{2}{|A|} adj\ A$

27. The inverse of a matrix A exists only if:

(a) $|A| = 0$

(b) $|A| \neq 0$

(c) A is diagonal.

(d) A is null.

28. If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then A is called a:

(a) Null matrix

(b) Diagonal matrix

(c) Identity matrix

(d) Square matrix

29. Which of the following is a diagonal matrix?

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

(b) $\begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$

(c) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

(d) $\begin{bmatrix} 2 & 2 \\ 2 & 2 \end{bmatrix}$

30. If A and B are square matrices of same order, then det(AB) =?

(a) det(A) + det(B)

(b) det(A) x det(B)

(c) det(A – B)

(d) det(A) – det(B)

31. How many ways can 5 distinct notebooks be arranged on a shelf?

(a) 25

(b) 60

(c) 120

(d) 720

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32. How many 3-digit numbers can be formed using digits 1–9 without repetition?
    (a) 729
    (b) 504
    (c) 648
    (d) 81

33. How many ways can the letters of the word **'BANANA'** be arranged?
    (a) 60
    (b) 120
    (c) 720
    (d) 360

34. From digits 1–6, how many odd 3-digit numbers can be formed without repetition?
    (a) 60
    (b) 80
    (c) 72
    (d) 36

35. The value of 0! is:
    (a) 0
    (b) 1
    (c) Undefined
    (d) Infinity

36. What is $\frac{10!}{8!}$?
    (a) 90
    (b) 80
    (c) 72
    (d) 90

37. Number of permutations of n different things taken r at a time is:
    (a) $\frac{n!}{(n-r)!}$
    (b) $\frac{r!}{(r-n)!}$
    (c) n^r
    (d) $(n+r)!$

38. If the order doesn't matter, which concept is used?
    (a) Permutation
    (b) Combination
    (c) Arrangement
    (d) Probability

39. How many combinations can be made from 5 objects taken 3 at a time?
    (a) 10
    (b) 20
    (c) 60
    (d) 120

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40. In how many ways can the letters of the word *"APPLE"* be arranged?
    (a) 60
    (b) 120
    (c) 240
    (d) 360

41. The average of a set of values is known as:
    (a) Median
    (b) Mean
    (c) Mode
    (d) Range

42. Which of the following is not a measure of central tendency?
    (a) Mean
    (b) Median
    (c) Mode
    (d) Range

43. The formula for arithmetic mean (AM) is:
    (a) $\Sigma x / N$
    (b) $N / \Sigma x$
    (c) $\Sigma x^2 / N$
    (d) None

44. The empirical relationship between mean, median and mode is:
    (a) Mean = 2 Median - Mode
    (b) Mode = 3 Median – 2 Mean
    (c) Mode – Mean = 5 (Mean - Median)
    (d) None

45. If Mean = 20 and Median = 18, then Mode =?
    (a) 16
    (b) 18
    (c) 14
    (d) 24

46. If data is 5, 10, 15, 20, then the median is:
    (a) 10
    (b) 12.5
    (c) 15
    (d) 20

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47. The most frequently occurring value in a data set is called:
    (a) Mean
    (b) Mode
    (c) Median
    (d) Average

48. What is the Standard deviation of 2, 4, 6, 8, 10?

    (a) 2.9

    (b) 2.828

    (c) 2.8

    (d) 3.5

49. The GM of 3 and 12 is
    (a) 6
    (b) 25
    (c) 9
    (d) 8

50. The relationship between AM, GM, HM

    (a)AM≥GM≥HM
    (b)AM=GM=HM
    (c)AM≤GM≤HM
    (d) AM > HM > GM