Seat No:_____   Enrollment No:_____

PARUL UNIVERSITY
FACULTY OF IT & COMPUTER SCIENCE
BCA/IMCA, Winter 2019-20 Examination

Semester: 1   Date: 02/12/2019
Subject Code: 05191101   Time: 2:00pm to 4:30pm
Subject Name: Basic Mathematics   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Answer the following questions.   15

    1. Define Set with example.

    2. Write the formula for summation of n terms in A.P series.

    3. Define Unit matrix with example.

    4. If $x = \sec\theta + \tan\theta$ and $y = \sec\theta - \tan\theta$ then find xy.

    5. What is common ratio of the following Geometric Series $2 + 6 + 18 + 54 + ...$?

    6. The value of $\sin^2\theta + \cos^2\theta =$ _____
        a) 1   b) -1   c) 0   d) 2

    7. Distance between (1,0) and (0,0) is,
        a) 0   b) -4   c) 1   d) 2

    8. The value of $^2C_1$ is_____
        a) 3   b) 6   c) 4   d) 2

    9. The value of 0! is_____.
        a) 10   b) 1   c) 0   d) -2

    10. What is the slope of equation y=mx+c is,
        a) 0   b) -10   c) m   d) -1

    11. The value of $\sin(-\theta) = \cos\theta$ **(True/False)**

    12. The no. of permutations of n different objects taken r at a time, where repetition is allowed is n^r. **(True/False)**

    13. In square matrix, the no. of columns and rows are same. **(True/False)**

    14. In matrix, $AB = BA$ where A, B are any matrices. **(True/False)**

    15. Two lines are parellel if their slopes are equal. **(True/False)**

Q.2 Answer the followings. (Any Five)   **(15)**

    1. If A={1,2,3}, B= {3,4,5} and C={1,3,5} then find $(A\cup B)$ and $(A\cap C)$.   **(03)**

    2. If A(2,-7) and B(8,3) are the given points, find the mid-point of line segment AB.   **(03)**

    3. Evaluate AB for $A = [1 \quad 2 \quad 3]$, $B = \begin{bmatrix} 1 \\ -3 \\ 5 \end{bmatrix}$.   **(03)**

    4. In how many different ways can letters of the word "ADJUST" be arranged so that vowels never comes together?   **(03)**

    5. Evaluate: $\cos(0) + 3\sin(0) + 2\sin\left(\dfrac{\pi}{2}\right) + 5\cos\left(\dfrac{\pi}{2}\right)$ **(03)**

    6. Verify whether the lines 3x+2y+1=0 and 6x+4y+3=0 are parallel or not.   **(03)**

Q.3 **Answer the following. (Any three)**   (15)
1. Show that the points (1, 4), (3,-2) and (-3,16) are co-linear.
2. In a recent survey of 400 students in a college, 100 were listed as studying typing (T) and 150 were listed as doing accountancy (A), 75 were registered for both courses. How many students were registered for typing only?
3. If 4th term of A.P. is 19 and 12th term is 51 then find 21st term of A.P.
4. If $\tan^2 45^0 - \cos^2 60^0 = x \sin 45^0 \tan 60^0$ then find value of x.

Q.4 **Answer the following.**

A.   Solve the following system of linear equation by Cramer's Rule   (05)
$$2x + y - z = 3, x + y + z = 1, x - 2y - 3z = 4$$

B.
1) Let $A = \begin{pmatrix} 1 & 2 & -3 \\ -1 & 0 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 2 & 4 & 0 \\ 3 & -1 & 1 \end{pmatrix}$, $C = \begin{pmatrix} 2 & 1 \\ 1 & 0 \\ -1 & 1 \end{pmatrix}$ evaluate (A+B)C.   (05)

2) Find the distance between the points (5,7) and (-3,m) is 10, then find the value of m.   (05)

OR

B.   **1)** Find the equation of the straight line which is perpendicular to the line 4x-y+5=0 and which passes through the point (1,-2).   (05)

2) A committee of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done? How many of these committees would consist of 1 man and 2 women?   (05)