Seat No: _____ **Enrollment No:_____**

PARUL UNIVERSITY

FACULTY OF IT & COMPUTER SCIENCE

BCA/ IMCA., Summer Examination 2017 - 18

Semester: 1 **Date: 08/06/2018**
Subject Code: 05191101/ 05391101 **Time: 10:30 am to 01:00 pm**
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 subset

2. Write the formula for summation of n terms in Arithmetic Progression series.

3. Define upper triangular 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 $2 + 6 + 18 + 54 + \ldots$?

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

7. Distance between (0,0) and (0,1) 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=-9x is,
a) 0 b) -10 c) 9 d) -9

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 perpendicular if their slopes are equal. **(True/False)**

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

1. If A={1,2,3}, B= {3,4,5} and C={1,3,5} then find (A∪ B) *and* (A∩ C). **(02)**

2. If A(2,-7) and B(8,3) are the given points, find the mid-point of line segment AB. **(02)**

3. Evaluate AB for $A = [1 \quad 2 \quad 3]$, $B = \begin{bmatrix} 1 \\ -3 \\ 5 \end{bmatrix}$. **(02)**

4. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? **(03)**

5. Evaluate: $\cos(0) + 3\sin(0) + 2\sin\left(\frac{\pi}{2}\right) + 5\cos\left(\frac{\pi}{2}\right)$ **(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 (12, 8), (-2, 6) and (6, 0) forms a right triangle.
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. An arithmetic progression has 3 as its first term. Also, the sum of the first 8 terms is twice the sum of the first 5 terms. Find the common difference.
4. Prove that: $(\sec\theta + \tan\theta - 1)(\sec\theta - \tan\theta + 1) = 2\tan\theta$.

Q.4 Answer the following.

A. If $\begin{vmatrix} x-1 & 2 & 1 \\ x & 1 & x+1 \\ 1 & 1 & 0 \end{vmatrix} = 4$, find the value(s) of x. **(05)**

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 angle between these two lines y = x and y = -x. **(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)**