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

PARUL UNIVERSITY

FACULTY OF IT & COMPUTER SCIENCE

BCA/IMCA, Winter 2018-19 Examination

Semester: 1 **Date: 01/11/2018**
Subject Code: 05191101/05391101 **Time: 10:30 am to 1:00 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.

A. Write short notes. **(05)**

1. What is the disjoint set?

2. State Dmorgan's law.

3. Define symmetric matrix with example.

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

5. If $\sin\alpha = \frac{1}{2}$, then $\cos\alpha$ =?

B. Multiple choice type questions/ Give the sentence true or false. (Each of 01 mark) **(10)**

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

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

3. How can we select two letters from {a,b,c}.
a) 3 b) 6 c) 4 d) 2

4. First term is 2 and common difference is 2 then T_5 is,
a) 10 b) 6 c) 8 d) 0

5. What is the slope of equation y=-x is,
a) -1 b) 1 c) 0 d) 2

6. The value of $\sin(90-\theta) = \cos\theta$ (True/ False)

7. The value of 0!=1 (True/ False)

8. In symmetric metrix $a_{ij}=a_{ji}$ (True/ False)

9. In matrix AA^{-1}= A (True/ False)

10. Two lines are perpendicular if their slopes are equal. (True/ False)

Q.2 Answer the following.

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

2. Find the summation of first 10 natural numbers. **(02)**

3. Evaluate $\begin{vmatrix} -1 & 3 \\ 4 & 1 \end{vmatrix}$. **(02)**

4. Find the locus of a point P such that the distant between P and (2, 5) is always 3. **(03)**

5. Find the 17th term of the arithmetic progression with first term 5 and common difference. **(03)**

6. If n=5 and r=2 find ${}^nC_r$. **(03)**

Q.3 Answer the following. (Any three) (5 marks each) **(15)**

1. Show that the points (2, 1), (3, 8) and (5, 2) forms a right triangle.

2. Solve $\begin{cases} 2x + 3y = 5 \\ -x + 4y = 1 \end{cases}$ using Cramer's Rule.

3. An arithmetic series has first term 4 and common difference 1

Find:

(i) the sum of the first 20 terms,

(ii) the sum of the first 100 terms.

4. If cosA=$\frac{12}{13}$ then evaluate sin2A and cos2A.

Q.4 Answer the following.

A. Prove that, $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc + ab + bc + ca$ **(05)**

B. 1) Find the sum of the geometric series **(05)**

2 + 6 + 18 + 54 + . . .

where there are 6 terms in the series.

2) Find the angle between these two lines y = x and y = -x. **(05)**

OR

B. 1) 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? **(05)**

2) 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+2B)C **(05)**