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

PARUL UNIVERSITY

FACULTY OF IT & COMPUTER SCIENCE

BCA/IMCA Winter 2017–18 Examination

Semester: 1 **Date: 03/01/2018**
Subject Code: 05191101/ 05391101 **Time: 10:30 am to 1:00 pm**
Subject Name: Basic Mathematics **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) Short Questions 1 mark of each. **[05]**

1) Let A = (a, b, c, d, e, f}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space.

f __ A

2) Write the following set in the roster/tabular form.

A = {x: x $\in$ N, x $\leq$ 5}

3) Identify following set is finite or infinite.

A = {x: x is English Alphabet}

4) What is the 10^{th} term of following G.P.?
$1,\frac{1}{2},\frac{1}{4},\frac{1}{8}$.....

5) In how many ways can the letters of the word ADJUST be arranged?

(b) MCQs (10 questions of 1 mark each) **[10]**

1) Every set is subset of _____
a) Itself b) universal set c) subset d) empty set

2) In how many ways can 6 men sit at a round table..?
a) 24 b) 120 c) 720 D) none of these

3)) Distance between the points (7,8) and (6,-2) is_____
a)$\sqrt{143}$ b)$\sqrt{101}$ c)$\sqrt{99}$ d) None of these

4)$\frac{3\pi}{4}$ is equal to _____degree
a) 145 b) 135 c) 160 d) 360.

5) If any row or column of a determinant is zero ,then value of determinant is _____
a) 0 b) 1 c) -1 d) none of these

6) In diagonal matrix, the elements of a principle diagonal is1, called _____
a) Unit matrix b) Diagonal matrix c) Scalar matrix d) None of these

7) How many lines can be drawn through 21 points on a circle?
a) 220 b) 210 c)230 d)441

8) What is the 50^{th} term of A.P?
37,33,29, 25_____
a) 233 b) 230 c)330 d) none of these

9)60° is equal to _____radian.
a)$\frac{\pi}{3}$ b)$\frac{\pi}{6}$ c)$\frac{\pi}{4}$d) none of these

10) IF matrix A is of order 2× 3 , and matrix B is of order 3× 2, then what is the order Of matrix AB?
A) 2× 2 b) 3× 3 c) 2× 3 d)3× 2

Q.2 Answer the following. (Any FIVE) (Each of 3 marks) **[15]**

1) Find the value of following determinants.

1) $\begin{vmatrix} 2x & 4y \\ x & 3y \end{vmatrix}$ 2) $\begin{vmatrix} x & x+1 \\ x+2 & x+3 \end{vmatrix}$

2) IF A $= \begin{bmatrix} 1 & 2 & -1 \\ -1 & 1 & 2 \\ 2 & -1 & 1 \end{bmatrix}$, then Find A + 3I.

3) Let A = { 0,1,2,3,4} , B = {2,4,5}, C = {0} and D= ∅,
Compute $A \cap B$, $B \cap C$, $A \cap C$, $C \cap D$.

4)3rd and 5th term of G.P. is 12 and 48 respectively. Find its second term?

5) Arrange the letter of word AUCTION in such a way that the vowels always occur together. Find the number of ways.

6) Show that the points (1, 4), (3, -2) & (-3, 16) are co- linear.

Q.3 Attempt any THREE. (Each of 5 marks) **[15]**

1 Solve the following System of linear equation by Cramer's rule.

$$2x + y - z = 3$$
$$x + y + z = 1$$
$$x - 2y - 3z = 4$$

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

3 If A $= \begin{bmatrix} 9 & 1 \\ 4 & 3 \end{bmatrix}$ B= $\begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$ Find the matrix X such that 3A + 5B + 2X =0

4 Prove the following.

$4(sin^4 30^o + cos^4 60^o) - 3(cos^2 45^o - sin^2 90^o) - 2 = 0$

Q.4 Answer the following.

(a) 1) Find the equation of line passing through the points (1, 5) and (3,-2). Also find the slope of line. **[05]**
2)If A(2,-7) and B(8,3) are the given points find the midpoint of line segment AB.

(b) Answer the following. **[10]**

1)Prove that : $\frac{sin\,\theta}{1-cos\theta} = \frac{1+cos\theta}{sin\theta}$

2) Find the sum of following series up to 30 terms.
7, $\frac{19}{2}$, 12, $\frac{29}{2}$ .....

OR

(b) Answer the following. **[10]**

1) If $tan^2 45^o - cos^2 60^o = x.sin45^o.tan60^o$, then find value of x.

2) If 4th term and 12th term of an Arithmetic Progression are 19 and 51 respectively. Find 21 term of Arithmetic Progression?