

**POST GRADUATE DIPLOMA IN
APPLIED STATISTICS (PGDAST)**

Term-End Examination

December, 2015

00389

**MST-001 : FOUNDATION IN MATHEMATICS
AND STATISTICS**

Time : 3 hours

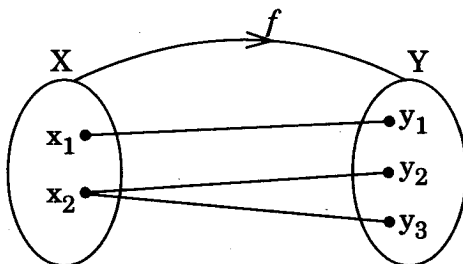
Maximum Marks : 50

Note :

- (i) Attempt **all** questions. Questions no. 2 to 5 have internal choices.
- (ii) Use of scientific calculator is allowed.
- (iii) Use of Formulae and Table Booklet for PGDAST is allowed.
- (iv) Symbols have their usual meaning.

1. State whether the following statements are *true* or *false* ? Give reasons in support of your answer. $5 \times 2 = 10$

- (a) The rule f shown in the following figure is a function :



- (b) If $A = \{2, 9, 7, 5\}$, $B = \{5, 2, 9, 7\}$, then $A = B$.

(c) $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} = 4.$

(d) Measurement of blood group comes under nominal scale of measurement.

(e) Caption refers to the row heading, and explains what information the row presents.

2. (a) Write the set $A = \{x : x^2 - 4x - 21 = 0, x^2 - 49 = 0, x \in N\}$ by roster method. 5

(b) If $A = \{a, b, c\}$, then write the power set of A. 3

(c) If $U = \{x : x \text{ is an English alphabet}\}$ and $A = \{x : x \text{ is a vowel of English alphabet}\}$, then write A' keeping U as universal set. 2

OR

Find the following sums : 2+3+5

(a) $3 + 7 + 11 + \dots$ to 101 terms

(b) $2 + 7 + 12 + \dots + 5002$

(c) $\frac{2}{9} + \frac{2}{3} + 2 + 6 + \dots + 486$

3. (a) Evaluate $\lim_{x \rightarrow 2} \frac{\sqrt{3+x} - \sqrt{5}}{x - 2}$. 5

(b) Find the derivative of the function

$(x + 2)^2 (x + 3) (x + 1).$ 5

OR

Evaluate the following integrals :

2+3+5

(a) $\int 5^x 2^x dx$

(b) $\int \left[\frac{x}{3} + (5x - 3)^3 + x \sqrt{x} \right] dx$

(c) $\int \frac{x^9}{x^{10} + 1} dx$

4. Solve the following system of equations by the matrix method :

10

$$2x + 3y = 5$$

$$4x + 6y = 10$$

OR

- (a) List five differences between primary and secondary data.

5

- (b) Express the matrix $A = \begin{bmatrix} 3 & 5 \\ -2 & 4 \end{bmatrix}$ as the sum of symmetric and skew symmetric matrices.

5

5. (a) A frequency distribution of marks of 50 students in a subject is as given below :

Class (Marks)	Frequency
0 – 10	6
10 – 20	10
20 – 30	14
30 – 40	18
40 – 50	2

Prepare relative and percentage frequency distributions.

5

- (b) Draw the multiple bar diagram for the following data :

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Year	Sales (in 1000 ₹)	Gross rofit (in 1000 ₹)	Net Profit (in 1000 ₹)
1990	100	30	10
1995	120	40	15
2000	130	45	25
2005	150	50	30
2010	200	70	30

OR

- (a) Draw less than ogive from the following frequency distribution of marks of 90 students :

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Marks	No. of students
0 – 9	7
10 – 19	11
20 – 29	19
30 – 39	8
40 – 49	20
50 – 59	14
60 – 69	8
70 – 79	3

- (b) Draw a stem-and-leaf display for the following data :

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31, 42, 22, 27, 33, 57, 67, 58, 64, 44, 65,
59, 46, 61, 35, 26, 63.
