

# BOARD QUESTION PAPER : JULY 2015

## ALGEBRA

Time: 2 Hours

Max. Marks: 40

Note:

- i. All questions are compulsory.
- ii. Use of calculator is not allowed.

Q.P. SET CODE

A

1. Attempt any five of the following subquestions:

[5]

- i. Find the first two terms of the following sequence:  
 $t_n = n + 2$ .
- ii. Write the quadratic equation  $3y^2 = 10y + 7$  in the standard form  $ax^2 + bx + c = 0$
- iii. Find the value of the following determinant:  $\begin{vmatrix} 4 & 3 \\ 2 & 7 \end{vmatrix}$
- iv. Write the sample space if two coins are tossed.
- v. State whether the following sequence is an A.P. or not.  
1, 3, 6, 10, ...
- vi. The perimeter of a rectangle is 36 cm. Write the equation for this statement using two variables.

2. Attempt any four of the following subquestions:

[8]

- i. If one root of the quadratic equation,  $x^2 - 7x + k = 0$  is 4, then find the value of k.
- ii. Find the eighteenth term of the A.P. 7, 13, 19, 25, ...
- iii. A die is thrown. Write the sample space. If P is the event of getting an odd number, then write the event P using set notation.
- iv. If  $D_x = 18$ ,  $D_y = 15$  and  $D = 3$  are the values of the determinants for certain simultaneous equations in  $x$  and  $y$ , then find the values of  $x$  and  $y$ .
- v. Form the quadratic equation if its roots are 5 and 7.
- vi. If for a certain frequency distribution, Median = 156 and Mode = 180, find the value of the Mean.

3. Attempt any three of the following subquestions :

[9]

- i. Solve the quadratic equation  $2x^2 + 5x + 2 = 0$  using formula method.
- ii. There are 30 tickets numbered from 1 to 30 in box and a ticket is drawn at random. If A is the event that the number on the ticket is a perfect square, then write the sample space S,  $n(S)$ , the event A and  $n(A)$ .
- iii. Obtain the sum of the first 56 terms of an A.P. whose 18<sup>th</sup> and 39<sup>th</sup> terms are 52 and 148 respectively.
- iv. Draw the graph of the equation  $3x - y = -6$  and write the points of intersection of the graph with X-axis and Y-axis.
- v. Electricity used by farmers during different parts of a day for irrigation is as follows:

| Part of the Day                | Morning | Afternoon | Evening | Night |
|--------------------------------|---------|-----------|---------|-------|
| Percentage of Electricity Used | 30      | 40        | 20      | 10    |

Draw a pie diagram to represent this information.

## 4. Attempt any two of the following subquestions:

[8]

- i. A card is drawn at random from a well-shuffled pack of 52 playing cards. Find the probability of the events that the card drawn is:  
 a. a king      b. a face card.
- ii. Solve the quadratic equation:  $3x^4 - 13x^2 + 10 = 0$
- iii. The maximum bowling speed (km/hour) of 33 players at a cricket coaching centre is given below:

|                              |        |         |         |         |
|------------------------------|--------|---------|---------|---------|
| <b>Bowling Speed (km/hr)</b> | 85-100 | 100-115 | 115-130 | 130-145 |
| <b>Number of Players</b>     | 9      | 11      | 8       | 5       |

Find the modal bowling speed of players.

## 5. Attempt any two of the following subquestions :

[10]

- i. Students of a school were made to stand in rows for drill. If 3 students less were standing in each row, 10 more rows would be required and if 5 students more were standing in each row, then the number of rows would be reduced by 10. Find the number of students participating in the drill.
- ii. In winter, the temperatures at a hill station from Monday to Friday are in A.P. The sum of the temperatures of Monday, Tuesday and Wednesday is  $0^{\circ}\text{C}$  and the sum of the temperatures of Thursday and Friday is  $15^{\circ}\text{C}$ . Find the temperature of each of the five days.
- iii. Draw the Histogram and hence, the Frequency polygon for the following frequency distribution:

|                                    |         |         |          |           |
|------------------------------------|---------|---------|----------|-----------|
| <b>House Rent (in ` per month)</b> | 400-600 | 600-800 | 800-1000 | 1000-1200 |
| <b>Number of families</b>          | 200     | 240     | 300      | 50        |