BOARD QUESTION PAPER : MARCH 2015
ALGEBRA

Time: 2 Hours   **Max. Marks: 40**

Note:
i.   *All* questions are compulsory.

ii.   Use of calculator is not allowed.

Q.1.   Attempt any five of the following sub-questions: **[5]**
    i.   State whether the following sequence is an A.P. or not?
            1, 4, 7, 10, ……..
    ii.   A card is drawn from the pack of 25 cards labelled with numbers 1 to 25. Write the sample space for this random experiment.
    iii.   Find the value of $x + y$, if
            $12x + 13y = 29$ and
            $13x + 12y = 21$
    iv.   For a sequence, if $S_n = \dfrac{n}{n+1}$, then find the value of S_{10}.
    v.   Verify whether 1 is the root of the quadratic equation:
            $x^2 + 3x - 4 = 0$.
    vi.   If $x + y = 5$ and $x = 3$, then find the value of y.

Q.2.   Attempt any four of the following sub-questions: **[8]**
    i.   Solve the following quadratic equation by factorization method
            $x^2 - 7x + 12 = 0$.
    ii.   Find the term t_{10} of an A.P. :
            4, 9, 14, ……..
    iii.   If the point A(2, 3) lies on the graph of the equation $5x + ay = 19$, then find a.
    iv.   A die is thrown. If A is an event of getting an odd number then write the sample space and event A in set notation.
    v.   For a certain frequency distribution, the value of Mean is 101 and Median is 100. Find the value of Mode.
    vi.   If one root of the quadratic equation $kx^2 - 7x + 5 = 0$ is 1, then find the value of k.

Q.3.   Attempt any three of the following sub-questions: **[9]**
    i.   Area under different crops in a certain village is given below. Represent it by a pie diagram:

Crop	Area in Hectares
Jowar	40
Wheat	60
Sugarcane	50
Vegetables	30

    ii.   If two coins are tossed, then find the probability of the event that at the most one tail turns up.
    iii.   Solve the following simultaneous equations using graphical method:
            $x + y = 7$;
            $x - y = 5$.
    iv.   There is an auditorium with 35 rows of seats. There are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row and so on. Find the number of seats in the twenty second row .
    v.   Solve the following quadratic equation by completing square method:
            $x^2 + 11x + 24 = 0$

Q.4. **Attempt any two of the following sub-questions:** [8]

i. Two digit numbers are formed using the digits 0, 1, 2, 3, 4, 5 where digits are not repeated.
P is the event that the number so formed is even.
Q is the event that the number so formed is greater than 50.
R is the event that the number so formed is divisible by 3
Then write the sample space S and events P, Q, R using set notation.

ii. The following table shows ages of 300 patients getting medical treatment in a hospital on a particular day:

Age (in years)	No. of Patients
10 – 20	60
20 – 30	42
30 – 40	55
40 – 50	70
50 – 60	53
60 – 70	20

Find the median age of the patient.

iii. If $\alpha + \beta = 5$ and $\alpha^3 + \beta^3 = 35$, find the quadratic equation whose roots are α and β.

Q.5. **Attempt any two of the following sub-questions:** 10]

i. Babubhai borrows ₹ 4,000 and agrees to repay with a total interest of ₹ 500 in 10 instalments, each instalment being less than the preceding instalment by ₹ 10. What should be the first and the last instalment?

ii. On the first day of the sale of tickets of a drama, in all 35 tickets were sold. If the rates of the tickets were ₹ 20 and ₹ 40 per ticket and the total collection was ₹ 900. Find the number of tickets sold at each rate.

iii. Given below is the frequency distribution of driving speeds (in km/hour) of the vehicles of 400 college students:

Speed (in km/hr)	No. of Students
20–30	6
30–40	80
40–50	156
50–60	98
60–70	60

Draw Histogram and hence the frequency polygon for the above data.