BOARD QUESTION PAPER : OCTOBER 2014
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.   Find S_2 for the following given A.P.:
        3, 5, 7, 9, ……. .

    ii.   If a = 1, b = 8 and c = 15, then find the value of $b^2 - 4ac$.

    iii.   Find the width of the class 35–45.

    iv.   By using two variables, write the following statement in mathematical form:
        "The cost of two tables and five chairs is ₹ 2,200."

    v.   If n(A) = 1 and n(S) = 13, then find P(A).

    vi.   For solving the given quadratic equation by 'completing square method', find the third term:
        $x^2 + 8x = -15$.

Q.2. Attempt any four of the following sub-questions: **[8]**
    i.   Find the first four terms in an A.P. when a = 3 and d = 4.

    ii.   Prepare the cumulative frequency (less than type) table from the given frequency distribution:

Class	Frequency
0–10	4
10–20	8
20–30	10
30–40	5
40–50	3

    iii.   Form the quadratic equation if the roots are 4 and 5.

    iv.   Find the value of the following determinant:
$$\begin{vmatrix} 3 & 3 \\ 2 & 16 \end{vmatrix}$$

    v.   Find t_n for an A.P. 1, 7, 13, 19, …… .

    vi.   Three coins are tossed simultaneously, find 'S' and n(S).

Q.3. Attempt any three of the following sub-questions: **[9]**
    i.   Find the first three terms of the following sequence, whose n^{th} term is
        $t_n = 2n + 2$.

    ii.   Solve the following quadratic equation by factorization method:
        $x^2 - 3x - 28 = 0$.

iii. Below is the distribution of money (in ₹) collected by students for flood relief fund:

Money (in ₹)	No. of Students
0–10	5
10–20	2
20–30	6
30–40	5
40–50	7

Find mean of money (in ₹) collected by a student using 'Direct Method'.

iv. Two digit numbers are formed from the digits 0, 1, 2, 3, 4 where digits are not repeated. Find the probability of the events that:
a.   the number formed is an even number   b.   the number formed is a prime number.

v. The number of hours spent by a school boy in different activities in a day is given below:

Activity	Sleep	School	Play	Home-work	Other	Total
No. of Hours	6	7	3	4	4	24

Represent the above information using pie diagram.

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

ii. Solve the following simultaneous equations:

$$\frac{27}{x-2} + \frac{31}{y+3} = 85;$$

$$\frac{31}{x-2} + \frac{27}{y+3} = 89.$$

iii. Two dice are thrown, find the probability of getting:
a.   The sum of numbers on their upper faces is at least 10.
b.   The sum of the number on their upper faces is divisible by 5.
c.   The number on the upper face of the first die is greater than the number on the upper face of the second die.

Q.5. Attempt any two of the following sub-questions: **[10]**
i. When the son will be as old as his father today, the sum of their ages then will be 126. When the father was as old as his son is today, the sum of their ages then was 38. Find their present ages.

ii. The following is the frequency distribution with unknown frequencies:

Class	60–70	70–80	80–90	90–100	Total
Frequency	a/2	3a/2	2a	a	50

Find the value of a, hence find the frequencies. Draw a histogram and frequency polygon on the same co-ordinate system.

iii. From the same place at 7 a.m. A started walking in the north at the speed of 4 km/hr. After 1 hour B started cycling in the east at a speed of 8 km/hr. At what time they will be at a distance of 20 km apart from each other?