BOARD QUESTION PAPER : MARCH 2016
ALGEBRA

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

Note:

Q.P. SET CODE

C

i.   *All* questions are compulsory.

ii. Use of calculator is not allowed.

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1.   **Attempt any five of the following subquestions:**   **[5]**
   i.   Write the first two terms of the sequence whose n^{th} term is
        $t_n = 3n - 4$.
   ii. Find the value of a, b, c in the following quadratic equation:
        $2x^2 - x - 3 = 0$
   iii. Write the quadratic equation whose roots are −2 and −3.
   iv. Find the value of the determinant:
        $$\begin{vmatrix} 4 & -2 \\ 3 & 1 \end{vmatrix}$$
   v.   Write the sample space for selecting a day randomly of the week.
   vi. Find the class mark of the classes $20 - 30$ and $30 - 40$.

2.   **Attempt any four of the following subquestions:**   **[8]**
   i.   If for an A.P. the first term is 11 and the common difference is (−2), then find first three terms of A.P.
   ii. Solve the following quadratic equation using factorization method:
        $x^2 + 11x + 24 = 0$.
   iii. If the value of determinants $\begin{vmatrix} x & -5 \\ 3 & 4 \end{vmatrix}$ is 31, then find the value of x.
   iv. A die is thrown, then find the probability of the following events:
        A is an Event : getting a number divisible by 3.
        B is an Event : getting a number less than 5.
   v.   Below is the given frequency distribution of words in an essay:

Number of Words	600 − 800	800 − 1000	1000 − 1200	1200 −1400	1400 − 1600
Number of Candidates	14	22	30	18	16

   Find the mean number of words written.

   vi. The marks obtained by a student in an examination are given below:

Subject	Marathi	Hindi	English	Mathematics	Total
Marks	95	90	95	80	360

   Represent the data using pie diagram.

3.   **Attempt any three of the following subquestions :**   **[9]**
   i.   Solve the following quadratic equation using formula method:
        $6x^2 - 7x - 1 = 0$.
   ii. There are three boys and two girls. A committee of two is to be formed. Find the probability of the following events:
        Event A : The committee contains at least one boy.
        Event B : The committee contains one boy and one girl.

iii. The measurements (in mm) of the diameters of the head of the screws are given below:

Diameter (in mm)	33 – 35	36 – 38	39 – 41	42 – 44	45 – 47
No. of screws	9	21	30	20	18

Calculate mean diameter of head of a screw by 'Assumed Mean Method'.

iv. The marks scored by students in Mathematics in a certain examinations are given below:

Marks Scored	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Number of students	3	8	15	17	7

Draw histogram for the above data.

v. Draw a frequency polygon for the following frequency distribution:

Rainfall (in mm)	20 – 25	25 – 30	30 – 35	35 – 40	40 – 45	45 – 50
No. of Years	2	5	8	12	10	7

4. Attempt any two of the following subquestions: **[8]**
i.   The 11th term and the 21st term of an A.P. are 16 and 29 respectively then find:
   a. The first term and common difference.
   b. The 34th term.
   c. 'n' such that t_n = 55.
ii. Solve the following simultaneous equations:

$$\frac{7}{2x+1} + \frac{13}{y+2} = 27, \frac{13}{2x+1} + \frac{7}{y+2} = 33$$

iii. In a certain race there are three boys A, B, C. The winning probability of A is twice than B and the winning probability of B is twice than C. If P(A) + P(B) + P(C) = 1, then find the probability of each boy.

5. Attempt any two of the following subquestions :   **[10]**
i.   The divisor and quotient of the number 6123 are same and the remainder is half the divisor. Find the divisor.
ii. Find the sum of all numbers from 50 to 350 which are divisible by 6. Hence find the 15th term of that A.P.
iii. A three digit number is equal to 17 times the sum of its digits. If 198 is added to the number, the digits are interchanged. The addition of first and third digit is 1 less than middle digit. Find the number.