

BOARD QUESTION PAPER : JULY 2017

ALGEBRA

Time: 2 Hours

Max. Marks: 40

Note:

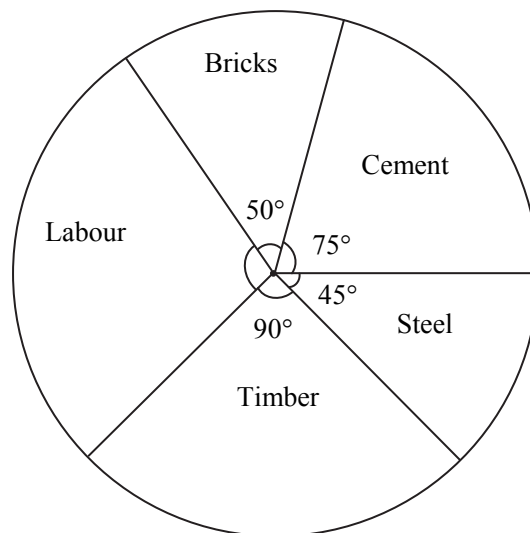
- i. All questions are compulsory.
- ii. Use of calculator is not allowed.

1. Attempt any five subquestions form the following: **[5]**

- i. Write the next two terms of the A.P. 2, 5, 8, 11,
- ii. Write the quadratic equation $7 = 4x - x^2$ in the form of $ax^2 + bx + c = 0$.
- iii. Find the value of the determinant: $\begin{vmatrix} -3 & 8 \\ 6 & 0 \end{vmatrix}$
- iv. A coin is tossed. For this random experiment write the sample space and find n(S).
- v. Find the class mark of the class 10 — 20.
- vi. For the quadratic equation $3x^2 + 2x - 1 = 0$, find the value of the discriminant.

2. Attempt any four subquestions from the following: **[8]**

- i. Write the 25th term of an A.P. 12, 16, 20, 24,
- ii. Find k, one of the roots of the quadratic equation $kx^2 - 7x + 12 = 0$ is 3.
- iii. For solving the following simultaneous equations by Cramer's rule, find the value of D_x and D_y : $3x - y = 7$; $x + 4y = 11$.
- iv. If two coins are tossed, then find the probability of the event: No head turns up.
- v. For a certain frequency distribution, the value of Mean is 101 and Median is 100. Find the value of Mode.
- vi. The following pie diagram represents expenditure on different items in constructing a building. If the total construction cost of building is Rs. 5,40,000, answer the following questions:
 - a. Find the central angle for labour expenditure.
 - b. Find the expenditure on labour.



3. Attempt any three subquestions from the following: **[9]**

- i. Solve the following quadratic equation by completing square: $z^2 + 4z - 7 = 0$.
- ii. Two dice are thrown. Find the probability of the following events:
 - Event A : The product of the numbers on their upper faces is 10.
 - Event B : The sum of the numbers on their upper faces is multiple of 9.
- iii. The following is the distribution of the size of certain farms from a taluka:

Size of Farm (in acres)	No. of Farms
5 – 15	7
15 – 25	12
25 – 35	17
35 – 45	25
45 – 55	31
55 – 65	5
65 – 75	3

Find the median size of farms.

- iv. Area under different crops in a certain village is given below. Represent it by pie diagram:

Crop	Area (in hectare)
Jowar	8000
Wheat	6000
Sugarcane	2000
Vegetable	2000

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

Class	Frequency
10 – 20	02
20 – 30	08
30 – 40	10
40 – 50	05
50 – 60	04

4. Attempt any two subquestions form the following:

[8]

- In a certain race there are three girls X, Y, Z. The winning probability of X is twice than Y and the winning probability of Y is twice than Z. If $P(X) + P(Y) + P(Z) = 1$, then find the winning probability of each girl.
- If the second term and the fourth terms of an A.P. are 12 and 20 respectively, then find the sum of first 25 terms:
- Solve the following simultaneous equations:

$$\frac{27}{x-2} + \frac{31}{y+3} = 85, \quad \frac{31}{x-2} + \frac{27}{y+3} = 89$$

5. Attempt any two subquestions from the following :

[10]

- The product of four consecutive positive integers is 840. Find the numbers.
- A three digit number is equal to 17 times the sum of its digits. If 198 is added to the number, the digits are interchange. The addition of first and third digit is 1 less than middle digit. find the number.
- Find the sum of all numbers from 50 to 350 which are divisible by 4. Also find 15th term.