

# Solution to Board's Question Paper (March 2025)

प्र. क्र.  
Q. No.

1 (A)

(i) (B)

(ii) (B)

(iii) (D)

(iv) (B)

(1 mark each)

Note : Answers with solutions are expected.

1 (B)

(i) Ans.

$$2x + y = 7 \quad \dots (1)$$

$$x + 2y = 11 \quad \dots (2)$$

Adding equations (1) and (2),

$$2x + y = 7 \quad \dots (1)$$

$$x + 2y = 11 \quad \dots (2)$$

$$3x + 3y = 18$$

(½ mark)

$$\therefore x + y = 6 \quad \dots (\text{Dividing both the sides by 3}) \quad (\frac{1}{2} \text{ mark})$$

The value of  $(x + y)$  is 6.

(ii) Ans.

$$x_n = 3n - 4$$

Substituting  $n = 1$ ,

$$x_1 = 3 \times 1 - 4$$

(½ mark)

$$= 3 - 4 = -1$$

(½ mark)

The first term is -1.

(iii) Ans.

There are 15 alphanumeric in the format of GSTIN. (1 mark)

youVA

(iv) Ans.

The Sample Space  $S = \{HH, HT, TH, TT\}$ .

(1 mark)

Note : Any two out of three activities are to be attempted. Here, we have completed all the three activities for the guidance of the students.

(i) Activity :

|        |         |        |
|--------|---------|--------|
| x      | -2      | 2      |
| y      | 3       | 1      |
| (x, y) | (-2, 3) | (2, 1) |

(½ mark)

(½ mark)

(½ + ½ mark)

(ii) Activity :

I am a quadratic equation.

My standard form is  $ax^2 + bx + c = 0$ .

(½ mark)

My roots are 5 and 12.

Sum of my roots 17

(½ mark)

Product of my roots 60

(½ mark)

My quadratic equation is  $x^2 - 17x + 60 = 0$ .

(½ mark)

(iii) Activity :

FV = ₹ 20, Premium = ₹ 4

MV = FV + Premium

(½ mark)

= 20 + 4 = ₹ 24

(½ mark)

Number of shares =  $\frac{\text{Total investment}}{\text{MV}} = \frac{24000}{24}$

(½ mark)

= 1000 shares.

(½ mark)



Note : Any four out of five questions are to be solved. Answers with solutions are expected.

(i) Solution :

$$x + y = 3 \quad \dots (1) \qquad 3x - 2y = 4 \quad \dots (2)$$

Multiplying equation (1) by 2,

$$2x + 2y = 6 \quad \dots (3) \quad \left(\frac{1}{2} \text{ mark}\right)$$

Adding equations (3) and (2),

$$2x + 2y = 6 \quad \dots (3)$$

$$3x - 2y = 4 \quad \dots (2)$$

$$\begin{array}{r} 5x = 10 \qquad \therefore x = \frac{10}{5} \qquad \therefore x = 2 \end{array} \quad \left(\frac{1}{2} \text{ mark}\right)$$

Substituting  $x = 2$  in equation (1), ( $\frac{1}{2}$  mark)

$$x + y = 3$$

$$\therefore 2 + y = 3 \quad \therefore y = 3 - 2$$

$$\therefore y = 1$$

Ans.  $(x, y) = (2, 1)$  is the solution. ( $\frac{1}{2}$  mark)

(ii) Solution :

$$m^2 + 14m + 13 = 0$$

$$\therefore m^2 + 1m + 13m + 13 = 0 \quad \left(\frac{1}{2} \text{ mark}\right)$$

$$\therefore m(m+1) + 13(m+1) = 0$$

$$\therefore (m+1)(m+13) = 0 \quad \left(\frac{1}{2} \text{ mark}\right)$$

$$\therefore m+1 = 0 \text{ or } m+13 = 0 \quad \left(\frac{1}{2} \text{ mark}\right)$$

$$\therefore m = -1 \text{ or } m = -13 \quad \left(\frac{1}{2} \text{ mark}\right)$$

Ans. -1 and -13 are the roots of the given quadratic equation.

(iii) Solution :

$$\text{Here, } a = t_1 = 7, t_2 = 13, t_3 = 19, t_4 = 25, \dots$$

$$d = t_2 - t_1 = 13 - 7 = 6, \quad n = 19 \quad \left(\frac{1}{2} \text{ mark}\right)$$

$$t_n = a + (n-1)d \quad \dots \text{(Formula)} \quad \left(\frac{1}{2} \text{ mark}\right)$$

$$\therefore t_{19} = 7 + (19-1) \times 6 \quad \dots \text{(Substituting the values)} \quad \left(\frac{1}{2} \text{ mark}\right)$$

$$= 7 + 18 \times 6$$

$$= 7 + 108$$

$$\therefore t_{19} = 115$$

(½ mark)

Ans. The 19th term is 115

(iv) Solution :

$$MV = ₹ 2000, \text{ Brokerage} = 0.5\%$$

$$\text{Brokerage per share} = \text{Rate of brokerage} \times MV$$

(½ mark)

$$= \frac{0.5}{100} \times 2000$$

$$= ₹ 10$$

(½ mark)

$$\text{Amount received after sale} = MV - \text{Brokerage}$$

(½ mark)

$$= ₹ (2000 - 10)$$

$$= ₹ 1990$$

(½ mark)

Ans. The amount received after sale is ₹ 1990

(v) Solution :

| Class<br>Time<br>(In hours) | Class<br>marks<br>( $x_i$ ) | Number of<br>Students<br>( $f_i$ ) | Class marks $\times$<br>Frequency<br>( $x_i f_i$ ) |
|-----------------------------|-----------------------------|------------------------------------|----------------------------------------------------|
| 0-2                         | 1                           | 8                                  | 8                                                  |
| 2-4                         | 3                           | 14                                 | 42                                                 |
| 4-6                         | 5                           | 18                                 | 90                                                 |
| 6-8                         | 7                           | 10                                 | 70                                                 |
| 8-10                        | 9                           | 10                                 | 90                                                 |
| Total                       |                             | $\Sigma f_i = 60$                  | $\Sigma x_i f_i = 300$                             |

(1 mark)

$$\text{Mean} = \bar{X} = \frac{\Sigma x_i f_i}{\Sigma f_i}$$

(½ mark)

$$= \frac{300}{60} = 5$$

(½ mark)



Ans. The mean time spent by a student is 5 hours.



Note : Any one out of two activities are to be attempted. Here, we have completed both the activities for the guidance of the students.

(i) Activity :

FV = ₹ 100, Number of shares = 300,

Market Value = ₹ 120.

(a) Sum invested = MV × Number of shares

$$= 120 \times 300$$

(½ + ½ mark)

$$= ₹ 36,000$$

(b) Dividend per share = FV × Rate of dividend

$$= 100 \times \frac{7}{100}$$

(½ + ½ mark)

$$= ₹ 7$$

∴ total dividend received = 300 × 7 = ₹ 2100

(½ mark)

(c) Rate of return =  $\frac{\text{Dividend income}}{\text{Sum invested}} \times 100$

$$= \frac{2100}{36000} \times 100 = 5.83\%$$

(½ mark)

(ii) Activity :

Let S be the sample space.

$$\therefore S = \{23, 25, 32, 35, 52, 53\}$$

(½ mark)

$$\therefore n(S) = 6$$

(½ mark)

Event A : The number so formed is an odd number.

$$\therefore A = \{23, 25, 35, 53\} \quad \therefore n(A) = 4$$

(½ mark)

$$P(A) = \frac{n(A)}{n(S)}$$

..... (Formula) (½ mark)

$$\therefore P(A) = \frac{4}{6}$$

(½ mark)

$$\therefore P(A) = \frac{2}{3}$$

(½ mark)

*Note : Any two out of four questions are to be solved. Here, we have solved all the four questions for the guidance of the students.*

(i) Solution :

$$4x + 3y = 18 \dots (1) \quad \text{Here, } a_1 = 4, b_1 = 3, c_1 = 18$$

$$3x - 2y = 5 \dots (2) \quad \text{Here, } a_2 = 3, b_2 = -2, c_2 = 5$$

$$D = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix} = \begin{vmatrix} 4 & 3 \\ 3 & -2 \end{vmatrix} = 4 \times (-2) - 3 \times 3 = -8 - 9 = -17 \quad (\frac{1}{2} \text{ mark})$$

$$D_x = \begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix} = \begin{vmatrix} 18 & 3 \\ 5 & -2 \end{vmatrix} = 18 \times (-2) - 3 \times 5 = -36 - 15 = -51 \quad (\frac{1}{2} \text{ mark})$$

$$D_y = \begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix} = \begin{vmatrix} 4 & 18 \\ 3 & 5 \end{vmatrix} = 4 \times 5 - 3 \times 18 = 20 - 54 = -34 \quad (\frac{1}{2} \text{ mark})$$

By Cramer's rule,

$$x = \frac{D_x}{D} = \frac{-51}{-17} = 3, \quad (\frac{1}{2} \text{ mark})$$

$$y = \frac{D_y}{D} = \frac{-34}{-17} = 2 \quad (\frac{1}{2} \text{ mark})$$

Ans.  $x = 3$  and  $y = 2$  is the solution. ( $\frac{1}{2}$  mark)

(ii) Solution :

$$x^2 - 2x - 3 = 0$$

Comparing with  $ax^2 + bx + c = 0$ ,

$$a = 1, b = -2, c = -3 \quad (\frac{1}{2} \text{ mark})$$

$$b^2 - 4ac = (-2)^2 - 4(1)(-3) \\ = 4 + 12 = 16 \quad (\frac{1}{2} \text{ mark})$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \dots \text{ (Formula)} \quad (\frac{1}{2} \text{ mark})$$

$$= \frac{-(-2) \pm \sqrt{16}}{2 \times 1} \quad (\frac{1}{2} \text{ mark})$$



$$= \frac{2 \pm 4}{2}$$

(1/2 mark)

$$= \frac{2(1 \pm 2)}{2} = 1 \pm 2$$

(1/2 mark)

$$\therefore x = 1 + 2 \text{ or } x = 1 - 2$$

$$\therefore x = 3 \text{ or } x = -1$$

(1/2 mark)

Ans. 3, -1 are the roots of the given quadratic equation.

(iii) Solution :

Let  $B_1, B_2, B_3$  are the boys and  $G_1, G_2$  are the girls.

$$S = \{B_1B_2, B_1B_3, B_2B_3, B_1G_1, B_1G_2, B_2G_1, B_2G_2, B_3G_1, B_3G_2, G_1G_2\}$$

(1/2 mark)

$$\therefore n(S) = 10$$

(1/2 mark)

Event A : At least one girl must be a member of the committee.

$$\therefore A = \{B_1G_1, B_1G_2, B_2G_1, B_2G_2, B_3G_1, B_3G_2, G_1G_2\}$$

(1/2 mark)

$$\therefore n(A) = 7$$

$$P(A) = \frac{n(A)}{n(S)} \therefore P(A) = \frac{7}{10}$$

(1/2 mark)

Event B : Committee must be of one boy and one girl.

$$\therefore B = \{B_1G_1, B_1G_2, B_2G_1, B_2G_2, B_3G_1, B_3G_2\}$$

(1/2 mark)

$$\therefore n(B) = 6$$

$$P(B) = \frac{n(B)}{n(S)} \therefore P(B) = \frac{6}{10} = \frac{3}{5}$$

(1/2 mark)

Ans. The probability of event A is  $\frac{7}{10}$  and that of event B is  $\frac{3}{5}$ .

(iv) Solution :

| Class<br>(Price in<br>Rupees) | Frequency<br>(Number of<br>Articles) | Cumulative<br>Frequency<br>(Less than type) |
|-------------------------------|--------------------------------------|---------------------------------------------|
| Less than 20                  | 140                                  | 140 → cf                                    |
| 20-40<br>Median class         | 100 → f                              | 240                                         |
| 40-60                         | 80                                   | 320                                         |
| 60-80                         | 60                                   | 380                                         |
| 80-100                        | 20                                   | 400                                         |
| Total                         | $\Sigma f_i = 400$                   |                                             |

(1 mark)

Here,  $N = \Sigma f_i = 400$

$$\frac{N}{2} = \frac{400}{2} = 200$$

200th score is in the class 20-40

(½ mark)

∴ 20-40 is the median class.

$L = 20, cf = 140, f = 100, h = 20$

(½ mark)

$$\text{Median} = L + \left[ \frac{\frac{N}{2} - cf}{f} \right] \times h \quad \dots \text{(Formula)} \quad (½ \text{ mark})$$

$$= 20 + \left[ \frac{200 - 140}{100} \right] \times 20 \quad \dots \text{(Substituting the values)}$$

$$= 20 + \frac{60}{100} \times 20 = 20 + 12 = 32 \quad (½ \text{ mark})$$

Ans. The median of the price is ₹ 32.



Note : Any two out of three questions are to be solved. Here, we have solved all the three questions for the guidance of the students.

(i) Solution :

Comparing  $(m-12)x^2 + 2(m-12)x + 2 = 0$  with  $ax^2 + bx + c = 0$ ,

$$a = (m-12), b = 2(m-12), c = 2. \quad (\frac{1}{2} \text{ mark})$$

$$b^2 - 4ac = [2(m-12)]^2 - 4(m-12)(2) \quad (1 \text{ mark})$$

$$= 4(m-12)^2 - 8m + 96$$

$$= 4(m^2 - 24m + 144) - 8m + 96$$

$$= 4m^2 - 96m + 576 - 8m + 96$$

$$= 4m^2 - 104m + 672 \quad (\frac{1}{2} \text{ mark})$$

The roots of the given quadratic equation are real and equal.

... (Given)

$$\therefore b^2 - 4ac = 0 \quad (\frac{1}{2} \text{ mark})$$

$$\therefore 4m^2 - 104m + 672 = 0$$

$$\therefore m^2 - 26m + 168 = 0 \quad \dots (\text{Dividing by } 4)$$

$$\therefore m^2 - 12m - 14m + 168 = 0 \quad \therefore m(m-12) - 14(m-12) = 0$$

$$\therefore (m-12)(m-14) = 0$$

$$\therefore m-12=0 \text{ or } m-14=0 \quad (\frac{1}{2} \text{ mark})$$

$$\therefore m=12 \text{ or } m=14 \quad (\frac{1}{2} \text{ mark})$$

If  $m=12$ ,  $m-12=0$  and  $(m-12)x^2=0$

i.e. the quadratic term becomes zero.

$\therefore$  the equation will not be a quadratic one.

$\therefore m=12$  is unacceptable.

$$\therefore m=14 \quad (\frac{1}{2} \text{ mark})$$

Ans. The value of  $m$  is 14.

(ii) Solution :

The person repays ₹ 1000 + ₹ 140 = ₹ 1140. ( $\frac{1}{2}$  mark)

The number of instalments = 12

$$\therefore n=12, S_n = S_{12} = 1140.$$

Each instalment is ₹ 10 less than the preceding one.

$$\therefore d = -10$$

... (A constant number)

This is an A.P.

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

... (Formula) (1/2 mark)

$$\therefore S_{12} = \frac{12}{2} [2a + (12-1) \times (-10)] \dots \text{(Substituting the values) (1/2 mark)}$$

$$\therefore 1140 = 6[2a + 11 \times (-10)]$$

$$\therefore 190 = 2a - 110 \dots \text{(Dividing both the sides by 6) (1/2 mark)}$$

$$\therefore 2a - 110 = 190$$

$$\therefore 2a = 190 + 110$$

$$\therefore 2a = 300$$

$$\therefore a = \frac{300}{2}$$

$$\therefore a = 150$$

... (The first instalment) (1/2 mark)

$$t_n = \text{last instalment}$$

$$t_n = a + (n-1)d \dots \text{(Formula) (1/2 mark)}$$

$$= 150 + (12-1) \times (-10) \dots \text{(Substituting the values) (1/2 mark)}$$

$$= 150 + 11 \times (-10)$$

$$= 150 - 110$$

$$= 40$$

... (The last instalment) (1/2 mark)

Ans. The first instalment is ₹ 150 and the last instalment is ₹ 40.

(iii) Solution :

First we find the value of  $x$ .

$$25 + x + 30 + 2x + 65 = 180$$

$$\therefore 3x + 120 = 180$$

$$\therefore 3x = 180 - 120$$

$$\therefore 3x = 60$$

$$\therefore x = 20$$

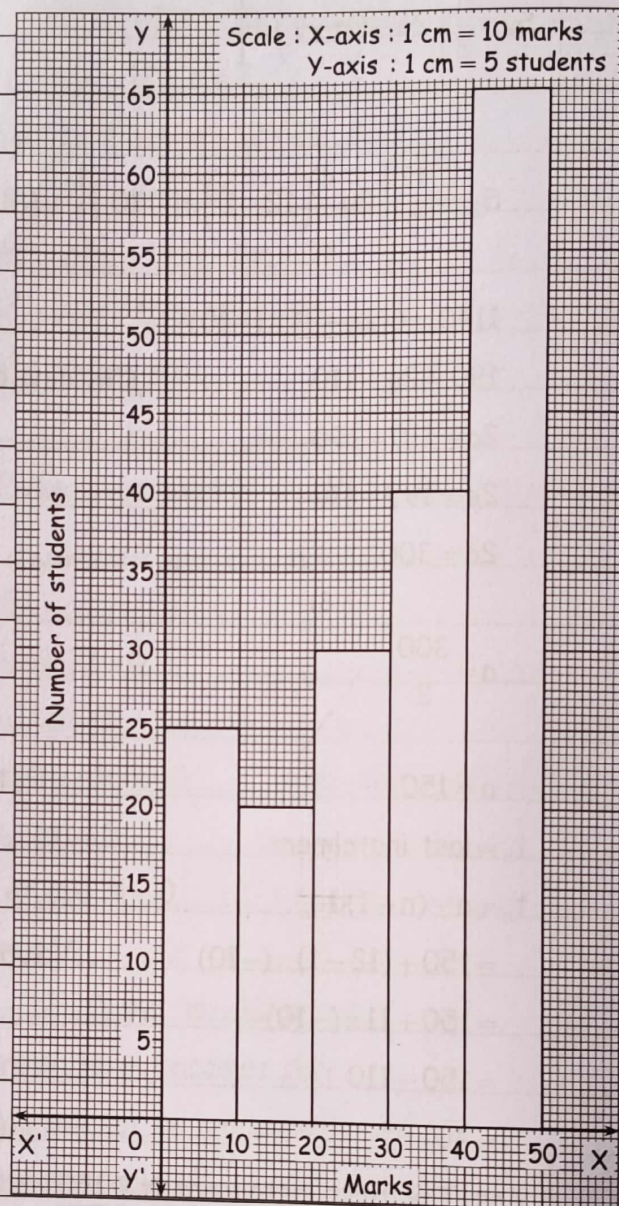
the value of  $x$  is 20.



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| Marks              | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|--------------------|------|-------|-------|-------|-------|
| Number of students | 25   | 20    | 30    | 40    | 65    |



[Scheme of marking :

(1) Finding the value of  $x$  : (1 mark)

(2) For correct scale and axes : ( $\frac{1}{2}$  mark)

(3) For drawing correct rectangles : ( $2\frac{1}{2}$  marks)]



Note : Any one out of two questions are to be solved. Here, we have solved both the questions for the guidance of the students.

(i) Solution :

$$2x = y + 2$$

$$\therefore y + 2 = 2x$$

$$\therefore y = 2x - 2$$

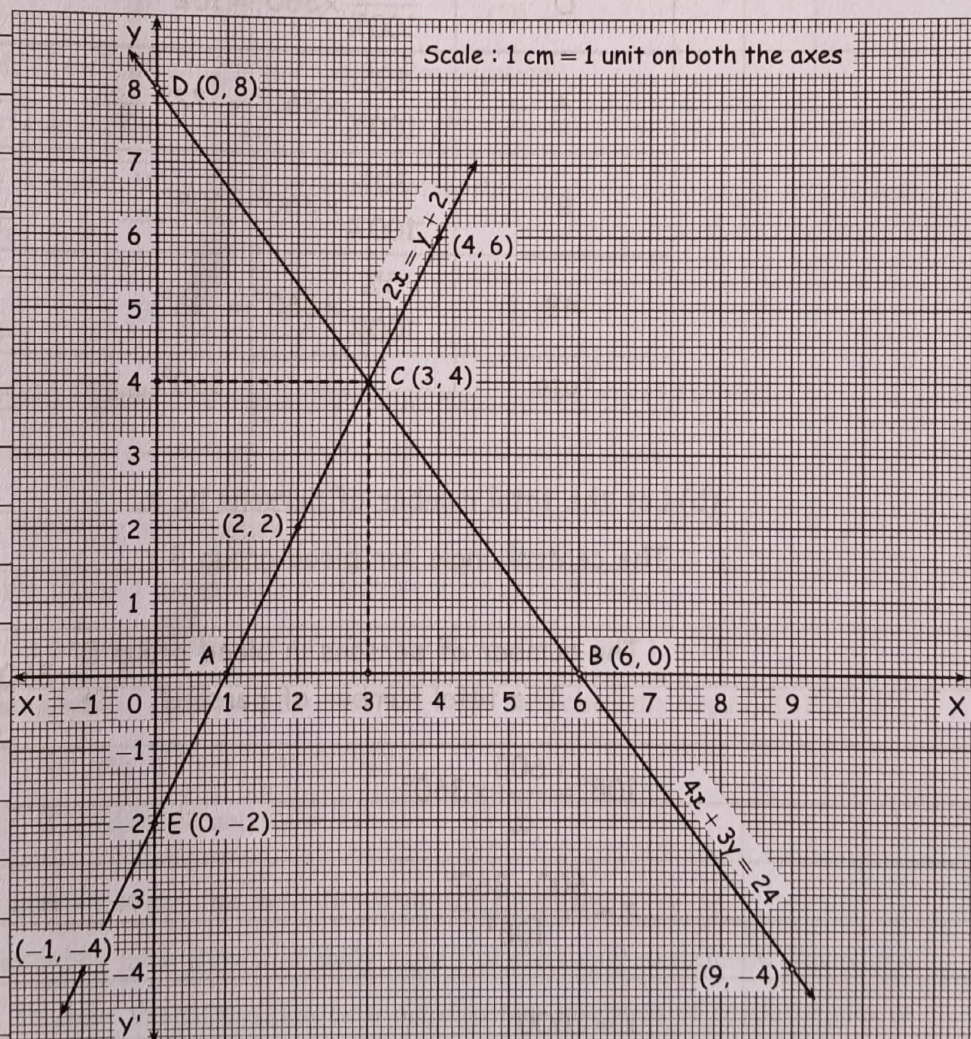
|        |          |         |        |        |
|--------|----------|---------|--------|--------|
| x      | -1       | 0       | 2      | 4      |
| y      | -4       | -2      | 2      | 6      |
| (x, y) | (-1, -4) | (0, -2) | (2, 2) | (4, 6) |

$$4x + 3y = 24$$

$$\therefore 3y = 24 - 4x$$

$$\therefore y = \frac{24 - 4x}{3}$$

|        |        |        |        |         |
|--------|--------|--------|--------|---------|
| x      | 0      | 3      | 6      | 9       |
| y      | 8      | 4      | 0      | -4      |
| (x, y) | (0, 8) | (3, 4) | (6, 0) | (9, -4) |



The lines intersect each other at the point C(3, 4).

From the graph  $\triangle ABC$  is formed by the two lines and the X-axis.



For  $\triangle ABC$ ,  $d(A,B) = (6-1) = 5$

$\therefore AB = 5$  and the perpendicular distance of point C on the X-axis is 4.

$$A(\triangle ABC) = \frac{1}{2} \times 5 \times 4 = 10 \text{ cm}^2.$$

[Scheme of marking : 1 mark for preparing a table; 1 mark for drawing correct graph of the given equations; 1 mark for finding the area of the triangle.]

(ii) Solution :

(a)

| Blood Group | Measure of the central angle                      |
|-------------|---------------------------------------------------|
| O           | $\frac{45\%}{100\%} \times 360^\circ = 162^\circ$ |
| A           | $\frac{20\%}{100\%} \times 360^\circ = 72^\circ$  |
| B           | $\frac{30\%}{100\%} \times 360^\circ = 108^\circ$ |
| AB          | $\frac{5\%}{100\%} \times 360^\circ = 18^\circ$   |
| Total       | $360^\circ$                                       |

( $\frac{1}{2}$  mark)

( $\frac{1}{2}$  mark)

( $\frac{1}{2}$  mark)

( $\frac{1}{2}$  mark)

(b) Let the total number of persons be  $x$ .

The central angle for blood group B

$$= \frac{\text{The number of persons in blood group B}}{\text{The total number of persons}} \times 360^\circ \quad (\frac{1}{2} \text{ mark})$$

$$\therefore 108^\circ = \frac{600}{x} \times 360^\circ$$

$$\therefore x = \frac{600 \times 360^\circ}{108^\circ}$$

$$\therefore x = 2000$$

( $\frac{1}{2}$  mark)

The total number of persons is 2000.