



केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठ

केवल परीक्षक द्वारा भरा जावे। प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

| प्रश्न क्रमांक | पृष्ठ क्रमांक | प्राप्तांक (अंकों में) | प्रश्न क्रमांक | प्राप्तांक (अंकों में) |
|----------------|---------------|------------------------|----------------|------------------------|
| 1              |               |                        | 17             |                        |
| 2              |               |                        | 18             |                        |
| 3              |               |                        | 19             |                        |
| 4              |               |                        | 20             |                        |
| 5              |               |                        | 21             |                        |
| 6              |               |                        | 22             |                        |
| 7              |               |                        | 23             |                        |
| 8              |               |                        | 24             |                        |
| 9              |               |                        | 25             |                        |
| 10             |               |                        | 26             |                        |
| 11             |               |                        | 27             |                        |
| 12             |               |                        | 28             |                        |
| 13             |               |                        |                |                        |
| 14             |               |                        |                |                        |
| 15             |               |                        |                |                        |
| 16             |               |                        |                |                        |

कुल प्राप्तांक

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99 1x33.9mmx16

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

→ परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

प्रमाणित किया जाता है कि अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टि एवं अंकों का योग सही है।  
निर्धारित मुद्रा: नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

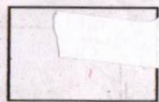
उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

V.No.34421  
N.P. GUPTA (MS)  
Govt. Girls HSS Pali  
Mob-9584878830

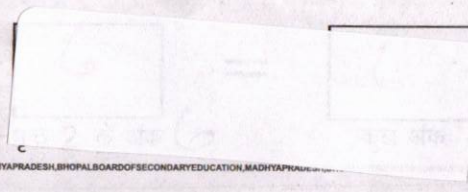
परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

V.No.34438  
B.R.KORI (M.S.)  
Govt.H.S.KIRANTAL  
Mob.No.9893356841

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योग पूर्व पृष्ठ

प्रश्न क्र.

Answer no. - 01

(i) (a) 2

(ii) (d) Infinitely many solutions

(iii) (b)  $b^2 - 4ac = 0$

(iv) (c) 20

(v) (a)  $\sqrt{8}$

(vi) (d) Infinite

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प्रश्न क्र.

Answer no.-02

i] irrational

ii] cubic

iii] -1

iv] similar

v] secant line

vi] 1

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प्रश्न क्र.

Answer no.-03

[i] False

[ii] True

[iii] False

[iv] False

[v] True

[vi] True

5



प्रश्न क्र.

Answer no. - 04

[i]  $9 \sec^2 A - 9 \tan^2 A$

→

~~(e) 1~~ (f) 9

[ii]  $\cos 0^\circ$

→

(e) 1

[iii]  $\sin 0^\circ$

→

(a) 0

[iv] Area of sector of angle  $\theta$  →

(b)  $\frac{\theta}{360} \times \pi r^2$

[v] Curved surface area of hemisphere →

(c)  $2\pi r^2$

[vi] Total surface area of hemisphere →

(d)  $3\pi r^2$

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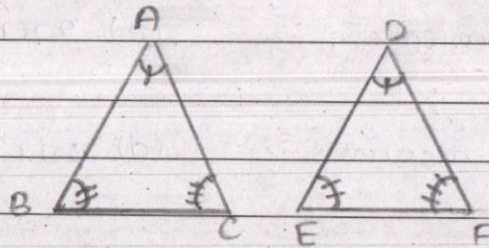
Answer no.-05

[i] Standard form of quadratic equation is:-

$$[ ax^2 + bx + c = 0 ]$$

[ii] One condition of similarity of two triangles:-

AAA:- "If three angles of a triangle are equal to the three corresponding angles of another triangle then both triangles are similar."

[iii] Distance between origin  $[0,0]$  and point  $[x_1, y_1]$  is:-

$$[ \sqrt{x_1^2 + y_1^2} ]$$

7



प्रश्न क्र.

(iv) If shadow and height of the pole are equal, then the angle of elevation of the sun is  $45^\circ$ .

(v) The formula of length of arc of a sector of angle  $\theta$  and radius  $r$  is:-

$$\left[ \frac{\theta}{360} \times 2\pi r \right]$$

(vi) Class mark [middle point] of 20-40 is 30.

P.T.O.

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प्रश्न क्र.

Answer no.:- 06 [01]

According to question,

we have to express 148 as product of prime factors.

So,

$$\begin{array}{r|l}
 2 & 148 \\
 \hline
 2 & 74 \\
 37 & 37 \\
 \hline
 & 1
 \end{array}$$

$$\begin{aligned}
 \text{So, } 148 &= 2 \times 2 \times 37 \\
 &= 2^2 \times 37
 \end{aligned}$$

Hence, 148 can be expressed as  $2^2 \times 37$ .

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प्रश्न क्र.

Answer no. - 07 [02]

Given:- numbers  $[7 \times 11 \times 13 + 13]$  and  $[7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5]$

To prove:- these numbers are composite numbers.

Proof :-

$$7 \times 11 \times 13 + 13$$

$$\Rightarrow 13 [7 \times 11 + 1] \quad 13 [7 \times 11 \times 1 + 1]$$

$$\Rightarrow 13 [77 + 1]$$

$$\Rightarrow \underline{13 \times 78}$$

Because, this number has two factors it is a composite number.

And

$$7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$$

$$\Rightarrow 5 [7 \times 6 \times 1 \times 4 \times 3 \times 2 \times 1 + 1]$$

$$\Rightarrow 5 [1008 + 1]$$

$$\Rightarrow \underline{5 \times 1009}$$

Because this number has two factors it is also a composite number.

Hence, proved.



प्रश्न क्र.

Answer no. - 08 [an]

Given:-  $x^2 - 3x - 10$

To find:- zeroes of polynomial

Solution:-

$$x^2 - 3x - 10$$

$$\Rightarrow x^2 - 5x + 2x - 10$$

$$\Rightarrow x[x - 5] + 2[x - 5]$$

$$\Rightarrow [x + 2][x - 5]$$

So,

|                           |                         |
|---------------------------|-------------------------|
| $x + 2 = 0$               | $x - 5 = 0$             |
| $\Rightarrow x = -2$      | $\Rightarrow x = 5$     |
| $\Rightarrow \alpha = -2$ | $\Rightarrow \beta = 5$ |

Hence, zeroes of the polynomial  $x^2 - 3x - 10$  are -2 and 5.

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प्रश्न क्र.

Answer no. - 09Given:-  $4u^2 + 8u$ To find:- zeroes of polynomialSolution:-  $4u^2 + 8u$ 

$$\Rightarrow [4u][u + 2]$$

now,

$$4u = 0$$

$$\Rightarrow u = \frac{0}{4}$$

$$\Rightarrow u = 0$$

$$\Rightarrow u = 0$$

$$u + 2 = 0$$

$$\Rightarrow u = -2$$

$$\Rightarrow \cancel{u} = \cancel{u} = -2$$

Hence, zeroes of  $4u^2 + 8u$  are 0 and -2.

प्रश्न क्र.

Answer no. - 10

Given:-  $x + 2y = 8$  - (i)

$x - y = 8$  - (ii)

By elimination method

Subtract eq (ii) from eq (i)

$$x + 2y = 8$$

$$-x - y = 8$$

$$3y = 0$$

$$\Rightarrow y = \frac{0}{3}$$

$$\Rightarrow \boxed{y = 0}$$

Now,

Put the value of 'y' in eq (ii)

$$x - y = 8$$

$$\Rightarrow x - (0) = 8$$

$$\Rightarrow \boxed{x = 8}$$

Hence, the value of  $x$  is 8 and  $y$  is 0.

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प्रश्न क्र.

Answer no. - 11Given:- A.P. : 2, 7, 12...

$$a = 2$$

$$d = 7 - 2 = 5$$

$$n = 10$$

To find:-  $a_{10}$ 

Solution:- 
$$\left[ \because a_n = a + (n-1)d \right]$$

$$\Rightarrow a_{10} = 2 + (10-1)5$$

$$\Rightarrow a_{10} = 2 + 9 \times 5$$

$$\Rightarrow a_{10} = 2 + 45$$

$$\Rightarrow a_{10} = 47$$

Hence, the 10<sup>th</sup> term of A.P. is 47.

14

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पृष्ठ 14 के अंक

प्रश्न क्र.

Answer no. - 12 [0.2]

Given:-  $OA \cdot OB = OC \cdot OD$

To show:-  $\angle A = \angle C$  and  $\angle B = \angle D$ .

Proof:- In  $\triangle OAD$  and  $\triangle OCB$   
 $OA \cdot OB = OC \cdot OD$  [given]

$$\Rightarrow \frac{OA}{OC} = \frac{OB}{OD}$$

and  $\angle DOA = \angle COB$  [vertically opposite angles]

Therefore by SAS similarity criteria

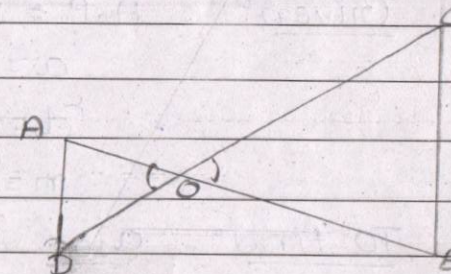
$$\triangle OAD \sim \triangle OCB$$

So, by CPST

$$\angle A = \angle C$$

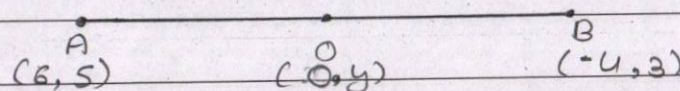
$$\text{and } \angle B = \angle D$$

Hence, proved.



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प्रश्न क्र.

Answer no. - 13Given:- Points A(6, 5) and B(-4, 3)To Find:- Point on y-axis that is equidistant from A and B.Solution:-

Let, the point be O(0, y) [x=0 on y-axis]

So, here,  $x_1 = 6, x_2 = -4, y_1 = 5, y_2 = 3$ 

Now,

distance formula:-

$$\therefore \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\Rightarrow \sqrt{(0-6)^2 + (y-5)^2} = \sqrt{(-4-0)^2 + (3-y)^2}$$

$$\Rightarrow [\sqrt{(-6)^2 + (y-5)^2}]^2 = [\sqrt{(-4)^2 + (3-y)^2}]^2$$

$$\Rightarrow 36 + y^2 + 25 - 10y = 16 + 9 + y^2 - 6y$$

$$\Rightarrow y^2 - 10y + 61 = y^2 - 6y + 25$$

$$\Rightarrow y^2 - y^2 - 10y + 6y = 25 - 61$$



प्रश्न क्र.

$$\Rightarrow -4y = -36$$

$$\Rightarrow y = \frac{-36}{-4}$$

$$\Rightarrow y = 9$$

Hence, the point on y axis which is equidistant from A(6, 5) and B(-4, 3) is (0, 9).

B  
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Answer no. -14 [cont]

Given:-

$$2 \tan 30^\circ$$

$$1 - \tan^2 30^\circ$$

$$\Rightarrow \frac{2 \times \frac{1}{\sqrt{3}}}{1 - \left(\frac{1}{\sqrt{3}}\right)^2}$$

$$1 - \left(\frac{1}{\sqrt{3}}\right)^2$$

$$\Rightarrow \frac{2}{\sqrt{3}}$$

$$1 - \frac{1}{3}$$

$$\Rightarrow \frac{\frac{2}{\sqrt{3}}}{\frac{3-1}{3}}$$



प्रश्न क्र.

B  
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$$\Rightarrow \frac{2}{\sqrt{3}}$$

$$\frac{2}{3}$$

$$\Rightarrow \frac{2}{\sqrt{3}} \times \frac{3}{2}$$

$$\Rightarrow \frac{3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} \quad [\text{By rationalising}]$$

$$\Rightarrow \frac{3\sqrt{3}}{3}$$

$$\Rightarrow \sqrt{3}$$

Hence, the value is  $\sqrt{3}$ .

P.T.O.

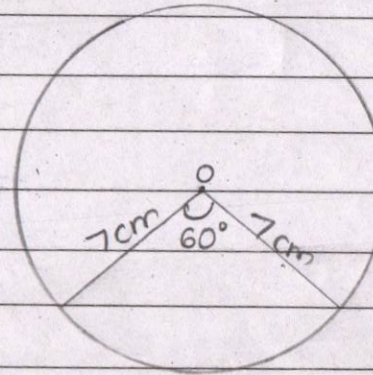


प्रश्न क्र.

Answer no. - 15 (a)

Given:-  $\theta = 60^\circ$   
 $r = 7 \text{ cm}$

To find:- length of the arc



Solution:-

$$\left[ \text{length of arc} = \frac{\theta}{360} \times 2\pi r \right]$$

$$\Rightarrow \frac{60^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times 7 \Rightarrow \frac{22}{3} \text{ cm or } 7.33 \text{ cm.}$$

Hence, the length of arc is  $\frac{22}{3}$  cm or 7.33 cm.

B  
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प्रश्न क्र.

Answer no. - 16 [or]Experiment: a dice thrown once.P[E] :- getting a ~~primary~~ prime number.

Number of outcomes favourable to E = 3 [2, 3, 5]

Total number of outcomes = 6 [1, 2, 3, 4, 5, 6]

$$\left[ \therefore P[E] = \frac{\text{Number of outcomes favourable to E}}{\text{Total number of outcomes}} \right]$$

$$\Rightarrow P[E] = \frac{3}{6}$$

$$\Rightarrow P[E] = \frac{1}{2}$$

Hence, probability of getting a prime number is  $\frac{1}{2}$ .

प्रश्न क्र.

Answer no. - 17Given:- Number of red balls = 3 balls

And number of black balls = 5 balls

Total number of outcomes = 8 balls

(i) To find:- probability of getting red ball

$$\therefore P(E) = \frac{\text{No. of outcomes favourable to E}}{\text{Total no. of outcomes}}$$

$$\Rightarrow P(E) = \frac{3}{8}$$

(ii) To find:- probability of getting of black ball

$$\therefore P(E) = \frac{\text{No. of outcomes favourable to E}}{\text{Total no. of outcomes}}$$

$$\Rightarrow P(E) = \frac{5}{8}$$

Hence, probability of getting a red ball is  $\frac{3}{8}$  and black ball is  $\frac{5}{8}$ .

प्रश्न क्र.

Answer no.-18

Given:-  $2x^2 - 5x + 3 = 0$

To Find:- roots of equation

Solution:-  $2x^2 - 5x + 3 = 0$

$$\Rightarrow 2x^2 - 2x - 3x + 3 = 0$$

$$\Rightarrow 2x(x-1) - 3(x-1) = 0$$

$$\Rightarrow (2x-3)(x-1) = 0$$

Now,

|                             |                   |
|-----------------------------|-------------------|
| $2x-3=0$                    | $x-1=0$           |
| $\Rightarrow 2x=3$          | $\Rightarrow x=1$ |
| $\Rightarrow x=\frac{3}{2}$ |                   |

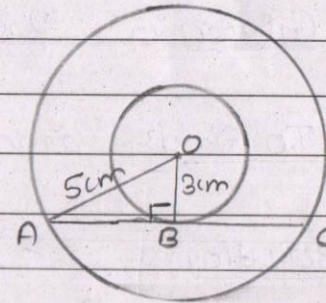
Hence, roots of equation are  $\frac{3}{2}$  and 1.

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प्रश्न क्र.

Answer no. - 19 (an)

Given:- radius of smaller circle ( $r$ ) = 3cm  
radius of bigger circle ( $R$ ) = 5cm



To Find:- length AC.

Solution:- By  $\angle OBA = 90^\circ$  [tangents are perpendicular to radius of circle]

Now, by pythagorus theorem

$$(OA)^2 = (OB)^2 + (AB)^2$$

$$\Rightarrow (5)^2 = (3)^2 + (AB)^2$$

$$\Rightarrow (AB)^2 = 25 - 9$$

$$\Rightarrow AB = \sqrt{16}$$

$$\Rightarrow AB = 4 \text{ cm}$$

Now,

$AB = BC$  [line perpendicular to radius bisect the chord]

$$\therefore AB = BC = 4 \text{ cm}$$

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प्रश्न क्र.

$$80, AC = AB + BC$$

$$\Rightarrow AC = 4 + 4$$

$$\Rightarrow \boxed{AC = 8 \text{ cm}}$$

Hence, length of chord is 8 cm.

B  
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Answer no.-20

Given:- volume of each cube =  $64 \text{ cm}^3$

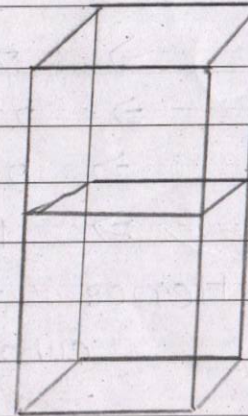
To find :- Surface area of of resulting cuboid.

Solution:-  $[\because \text{volume of cube} = a^3]$

$$\Rightarrow a^3 = 64 \text{ cm}^3$$

$$\Rightarrow a = \sqrt[3]{64 \text{ cm}^3}$$

$$\Rightarrow a = 4 \text{ cm}$$





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Now, in resulting cuboid

$$l = 4 \text{ cm}$$

$$b = 4 \text{ cm}$$

$$h = 2 \times 4 \text{ cm} = 8 \text{ cm}$$

So,

$$\therefore \text{TSA of cuboid} = 2[lb + bh + hl]$$

$$\Rightarrow 2[4 \times 4 + 4 \times 8 + 8 \times 4]$$

$$\Rightarrow 2[16 + 32 + 32]$$

$$\Rightarrow 2[80]$$

$$\Rightarrow 160 \text{ cm}^2$$

Hence, total surface area of resulting cuboid is  $160 \text{ cm}^2$ .

प्रश्न क्र.

Answer no. - 21Let, the numerator be  $= x$ and denominator be  $= y$ 

According to the question

$$\frac{x+2}{y+2} = \frac{9}{11}$$

$$\Rightarrow 11(x+2) = 9(y+2)$$

$$\Rightarrow 11x + 22 = 9y + 18$$

$$\Rightarrow 11x - 9y = 18 - 22$$

$$\Rightarrow 11x - 9y = -4 \quad \text{--- (i)}$$

and

$$\frac{x+3}{y+3} = \frac{5}{6}$$

$$\Rightarrow 6(x+3) = 5(y+3)$$

$$\Rightarrow 6x + 18 = 5y + 15$$

$$\Rightarrow 6x - 5y = 15 - 18$$

$$\Rightarrow 6x - 5y = -3 \quad \text{--- (ii)}$$

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प्रश्न क्र.

Now, in eq (i)

$$6x - 5y = -3$$

$$\Rightarrow 6x = -3 + 5y$$

$$\Rightarrow x = \frac{-3 + 5y}{6} \quad \text{--- (ii)}$$

Now, put the value of  $x$  in eq (i)

$$11x - 9y = -4$$

$$\Rightarrow 11\left(\frac{-3 + 5y}{6}\right) - 9y = -4$$

$$\Rightarrow \frac{-33 + 55y}{6} - 9y = -4$$

$$\Rightarrow \frac{-33 + 55y - 54y}{6} = -4$$

$$\Rightarrow -33 + y = -24$$

$$\Rightarrow y = -24 + 33$$

$$\Rightarrow \boxed{y = 9}$$

Now, put the value of  $y$  in eq (ii)B  
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प्रश्न क्र.

$$\Rightarrow x = \frac{-3 + 5y}{6}$$

$$\Rightarrow x = \frac{-3 + 5(9)}{6}$$

$$\Rightarrow x = \frac{-3 + 45}{6}$$

$$\Rightarrow x = \frac{42}{6}$$

$$\Rightarrow \boxed{x = 7}$$

Hence, the fraction is  $\boxed{\frac{7}{9}}$ .

Answer no. - 22 [an]

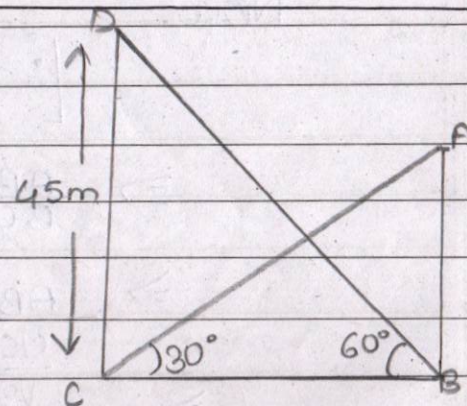
Given:-

$$\angle ACB = 30^\circ$$

$$\angle DBC = 60^\circ$$

height of tower [CD] = 45m

To Find:- Height of building [AB]





प्रश्न क्र.

Solution:-

$$\left[ \therefore \tan 60^\circ = \sqrt{3} \right]$$

$$\Rightarrow \frac{CD}{BC} = \sqrt{3}$$

$$\Rightarrow \frac{45}{BC} = \sqrt{3}$$

$$\Rightarrow BC = \frac{45}{\sqrt{3}} \text{ m}$$

Now,

$$\left[ \therefore \tan 30^\circ = \frac{1}{\sqrt{3}} \right]$$

$$\Rightarrow \frac{AB}{BC} = \frac{1}{\sqrt{3}}$$

$$\Rightarrow \frac{AB}{\frac{45}{\sqrt{3}}} = \frac{1}{\sqrt{3}}$$

$$\Rightarrow AB = \frac{1}{\sqrt{3}} \times \frac{45}{\sqrt{3}}$$

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प्रश्न क्र.

$$\Rightarrow AB = \frac{45}{3}$$

$$\Rightarrow AB = \cancel{15} \text{ cm } 15 \text{ cm}$$

Hence, the height of building is 15 cm.

B  
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Answer no. - 23 (cont.)

| Literary rate<br>(in %) | Number of<br>cities ( $f_i$ ) | $x_i$ | $d_i$        | $u_i$ | $f_i d_i$                 |
|-------------------------|-------------------------------|-------|--------------|-------|---------------------------|
| 45-55                   | 3                             | 50    | -20          | -2    | -60                       |
| 55-65                   | 10                            | 60    | -10          | -1    | -100                      |
| 65-75                   | 11                            | 70    | 0            | 0     | 0                         |
| 75-85                   | 8                             | 80    | 10           | 1     | 80                        |
| 85-95                   | 2                             | 90    | 20           | 2     | 40                        |
|                         | $\Sigma f_i = 34$             |       | $\Sigma d_i$ |       | $\Sigma f_i d_i =$<br>-40 |

Here,  $a = 70$



प्रश्न क्र.

$$\therefore \bar{x} = a + \left[ \frac{\sum f_i d_i}{\sum f_i} \right]$$

$$\Rightarrow \bar{x} = 70 + \left[ \frac{-20}{17} \right]$$

$$\Rightarrow \bar{x} = 70 - \frac{20}{17}$$

$$\Rightarrow \bar{x} = 70 - 1.17$$

$$\Rightarrow \bar{x} = 68.83\% \text{ (approx)}$$

Hence, mean literacy rate is 68.83% (approx).

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