Eighth Intra School Maths Olympiad

2017

Class - 9

Solution Key

Section A

Q1. (D) $(3^{-2})^{\frac{1}{2}} = 3^{-1} = \frac{1}{3}$

Q2. (E) $(-1)^{31} + 51 = -1 + 51 = 50$

Q3. (A)

Q4. (C) $180 - (30 - a) = 125 + 2a$

$\Rightarrow 150 + a = 125 + 2a$

$\Rightarrow a = 25$

Q5 (D) $\frac{1}{4} \times 800 = 200 cm^2$

Q6 (D) $\frac{x_1 + x_2 + x_3 + \cdots + x_n}{n} = 72$

$\Rightarrow x_1 + x_2 + x_3 + \cdots + x_n = 72n$

$\Rightarrow 3(x_1 + x_2 + x_3 + \cdots + x_n) = 216n$

$\Rightarrow \frac{3(x_1 + x_2 + \cdots + x_n)}{n} = 216$

Q7 (C) Chord

Q8 (E) $\pi R l = \pi r x$

$\Rightarrow \pi R \left(\frac{x}{2}\right) = \pi r x$

$\Rightarrow R = 2r$

Area $\pi R^2 = \pi (2r)^2$

$= 4\pi r^2$

Q9 (A) Number of women = 70 - 65
= 05

$P(\text{women}) = \frac{05}{70} = \frac{1}{14}$

Q10 (C) $\frac{7+14+21+--+70}{10}$

$= \frac{7(1+2+--+10)}{10}$

$= \frac{7 \times 10 \times 11}{2 \times 10} = \frac{77}{2} = 38.5$

Section B

Q11 (D)

Q12 (B)

Q13 (C) (+4, +12, +16, +28)

Q14 (B) 2 ∵ 6 - 4 = 2

Q15 (B) Prashant born on 9 Feb i.e. Monday

Section C

Q16 (E) $\frac{1}{x} = \frac{1}{2+3\sqrt{2}} = \frac{2-3\sqrt{2}}{-14}$

$\Rightarrow \frac{14}{x} = -(2-3\sqrt{2}) = -2+3\sqrt{2}$

$x + \frac{14}{x} = 2+3\sqrt{2} - 2 + 3\sqrt{2} = 6\sqrt{2}$

Q17

Q17 (C)

$$\frac{3^{2n+2} \times 3^{n} - 3^{3n}}{3^{3m} \times 2^{3}} = 3^{6}$$

$$\Rightarrow \frac{3^{2n+2+n} - 3^{3n}}{3^{3m} \times 8} = 3^{6}$$

$$\Rightarrow \frac{3^{3n}(3^{2} - 1)}{3^{3m} \times 8} = 3^{6}$$

$$\Rightarrow 3^{3n-3m} = 3^{6}$$

$$\Rightarrow 3n - 3m = 6$$

$$\Rightarrow n - m = 2$$

Q18 (B) $\frac{4}{3}\pi k^{3} = n \times \frac{4}{3}\pi R^{3}$

$$\Rightarrow k^{3} = n R^{3}$$

$$\Rightarrow R = \frac{k}{\sqrt[3]{n}}$$

Q19(A) $\angle XMY = 150^{\circ}$ (linear pair)

$$\Rightarrow \angle YXM = 180^{\circ} - (150^{\circ} + 15^{\circ})$$

$$= 15^{\circ}$$

$$\Rightarrow XM = YM$$

But $YM = MZ$

$$\Rightarrow XM = MZ$$

$$\Rightarrow \angle MXZ = \angle XZY$$

$$\Rightarrow 2\angle XZY = 180^{\circ} - 30^{\circ}$$

$$\Rightarrow \angle XZY = 75^{\circ}$$

Q20.(A) $p(5) = p\left(5+\frac{3}{2}\right)$

$\Rightarrow p(5) = p\left(\frac{13}{2}\right)$

$\Rightarrow p\left(\frac{13}{2}\right) = 2010$

Let $x = \frac{13}{2}$

$\Rightarrow p\left(\frac{13}{2}\right) = p\left(\frac{13}{2}+\frac{3}{2}\right)$

$\Rightarrow p\left(\frac{13}{2}\right) = p(8)$

$\Rightarrow p(8) = 2010$

Section D

Q21(B) Let part of A = x , B = y , C = z

$\Rightarrow x+y = \frac{19}{23}$ $\quad y+z = \frac{8}{23}$

$\Rightarrow x+2y+z = \frac{27}{23}$

But $x+y+z = 1$ (total work)

$\Rightarrow y = \frac{27}{23} - 1 = \frac{4}{23}$

$\Rightarrow x = \frac{15}{23}$

Amount of A $= \frac{15}{23} \times 529 = 15 \times 23 =$ Rs 345

Q22(B) $\pi r^2 h = \pi R^2 H$

$\Rightarrow r^2 h = R^2 \times 2R$

$\Rightarrow r^2 = 2R^2$

$\Rightarrow R = \frac{1}{\sqrt{2}} r$

Q23(D) Time $= \frac{\text{Distance}}{\text{speed}}$

Time taken by Reema $= \frac{30}{10} = 3$ hrs

let Speed of Gopal $= x$ km/h

$\Rightarrow$ Time taken by Gopal $= \frac{30}{x}$ hrs

$\Rightarrow 3 - \frac{30}{x} = 1$

$\Rightarrow x = 15$ km/h

Q24 (A) $4x = 360 - 160$

$\Rightarrow 4x = 200$

$\Rightarrow x = 50$

Shaded area $= 100 + 140 = 240$

$P(\text{shaded area}) = \frac{240}{360} = \frac{2}{3}$

Q25 (C) Side of fifth square $= 3 - 1 + 8 - 4$

$= 6$ units

$\Rightarrow k^2 = 36.$