

M. Prakash Institute

STD VIII - Entrance Test 3

19 April 2026

Time: 3 hours

Note: Q1 to Q10 are of 2 marks each, Q11 to Q30 are of 4 marks each.

Total Marks: 100

Paper Type:AD

Student Receipt number:

Student Name:

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	85	59	09	50	04	25	54	58	72	28
Ques.	11	12	13	14	15	16	17	18	19	20
Ans.	70	65	54	65	29	22	30	32	37	34
Ques.	21	22	23	24	25	26	27	28	29	30
Ans.	28	06	57	54	11	38	46	72	77	33

Q1. If $m \oplus n = (m+1) + (m+2) + (m+3) + \dots + (m+n) + (m+n+1)$, find **a** when $a \oplus 8 = 810$.

Solution:

$$\begin{aligned}
 a \oplus 8 &= (a+1) + (a+2) + \dots + (a+8) + (a+8+1) = 810 \\
 &\Rightarrow 9a + 45 = 810 \\
 &\Rightarrow 9a = 765 \\
 &\Rightarrow a = 85
 \end{aligned}$$

Ans. 85.

Q2. Find the least number which when divided by 3, 4, and 5 leaves remainders 2, 3, and 4 respectively.

Solution:

$$\begin{aligned}
 \text{Required number} &= (\text{LCM of } 3, 4, 5) - 1 \\
 \text{LCM} &= 60, \quad \text{Ans. 59.}
 \end{aligned}$$

Q3. Find the sum of the digits at the unit's place of 18^{81} and 81^{18}

Solution: For units place digit 8, we get (8, 4, 2, 6) digits in units place for powers of 8.81 ÷ 4 gives remainder as 1, so digit 8 will be in unit's place of 18^{81} .Similarly for 81^{18} , units place digit is 1. $\Rightarrow \text{Sum} = 8 + 1 = 9$. **Ans. 9.**

Q4. Find the sum of all perfect square integers between $\sqrt{16}$ and $\sqrt{841}$

Solution: Perfect squares between $\sqrt{16} = 4$ and $\sqrt{841} = 29$ are 9, 16, 25 $\Rightarrow \text{sum} = 9 + 16 + 25 = 50$. **Ans. 50.**

Q5. x varies directly with the square of y . When x is 2, y is also 2. Find positive value of y when x is 8.

Solution: x varies directly with square of $y \Rightarrow \frac{x}{y^2} = \text{constant}$.

$$x = 2, y = 2 \Rightarrow \text{constant} = \frac{2}{2^2} = \frac{1}{2} \quad \text{When } x = 8 \text{ we get } \frac{8}{y^2} = \frac{1}{2} \Rightarrow y^2 = 16 \Rightarrow y = 4.$$

Ans. 4.

Q6. By which smallest positive integer should 1080 be multiplied to get a perfect cube.

Solution: $1080 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 = 2^3 \times 3^3 \times 5^1 \Rightarrow 1080 \times 5^2$ gives perfect cube. $\Rightarrow$ smallest number = 25. **Ans. 25.**

Q7. The sum of 2025 and a number **A** is divisible by 7 and 11. Find the least value of **A**

Solution: $(2025 + A)$ is divisible by 7 and 11 means it is divisible by 77 $2025 \div 77$ gives remainder 23 $\Rightarrow A = 77 - 23 = 54$. **Ans. 54.**

Q8. If 70% of 60% of $x = 58$; then what is $x\%$ of 42 ?

Solution: $\frac{70}{100} \times \frac{60}{100} \times x = 58$

Rearranging and simplifying $\Rightarrow \frac{x}{100} \times 42 = 58$. **Ans. 58.**

Q9. Maya and Jaya together plucked 120 flowers. $\frac{1}{3}$ rd of the number of flowers Jaya plucked is 18 more than $\frac{1}{8}$ th of the number of flowers Maya plucked. How many flowers did Jaya pluck?

Solution: Suppose Jaya plucked x flowers. So Maya plucked $(120 - x)$ flowers.

$\frac{1}{3}x = \frac{1}{8}(120 - x) + 18 \Rightarrow \frac{x}{3} + \frac{x}{8} = 33 \Rightarrow x = 72$. **Ans. 72.**

Q10. Find sum of all the prime factors of 2310.

Solution: $2310 = 2 \times 3 \times 5 \times 7 \times 11$ sum = $2 + 3 + 5 + 7 + 11 = 28$. **Ans. 38.**

Q11. If

$$\frac{7x-1}{4} - \frac{1}{3} \left(2x - \frac{1-x}{2} \right) = \frac{19}{3}, \quad \text{Find } 10x$$

Solution:

$$\Rightarrow \frac{7x}{4} - \frac{1}{4} - \frac{2x}{3} + \frac{1-x}{6} = \frac{19}{3}$$

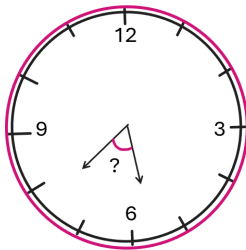
$$\Rightarrow \frac{7x}{4} - \frac{2x}{3} - \frac{x}{6} = \frac{19}{3} + \frac{1}{4} - \frac{1}{6}$$

$$\Rightarrow \frac{21x - 8x - 2x}{12} = \frac{776 + 3 - 2}{17}$$

$$\Rightarrow 11x = 77$$

$$\Rightarrow x = 7 \Rightarrow 10x = 70 \quad \text{Ans. 70.}$$

Q12.



Two different analog clocks show time 5:40 and 7:50. The clock in the figure shows the positions of only hour hands of both these clocks. Find the angle between these hour hands.

Solution: At 5:40, hour hand moves forward from 5 in $\left(\frac{40}{2}\right)^\circ$

At 7 : 50, hour hand moves forward From 7 in $\left(\frac{50}{2}\right)^\circ$ Angle between 5 to 7 is 60°

$\therefore$ Angle between these two hour hands = $60^\circ - 20^\circ + 25^\circ = 65^\circ$

Ans. 65.

Q13. In a rural school, 128 students were initially enrolled. The school experiences a 25% dropout rate every year. How many students will remain in the school after a period of three years?

Solution: Solving as depreciation by C.I.

$$\therefore A = 128 \left(1 - \frac{25}{100}\right)^3 = 128 \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4} = 54. \quad \text{Ans. 54.}$$

Q14. International Space Station (ISS) had enough provisions for 20 people to survive 30 days when a team of 4 astronauts, including Shubhanshu Shukla, joined 6 existing crew members on the ISS. After staying for 21 days, the team of 4 departed. For how many days will the remaining provisions last for the 6 crew members?

Solution: Let x be the number of days, So by inverse variation.... $20 \times 30 = 10 \times 21 + 6 \times x \Rightarrow x = 65$. **Ans. 65.**

Q15.

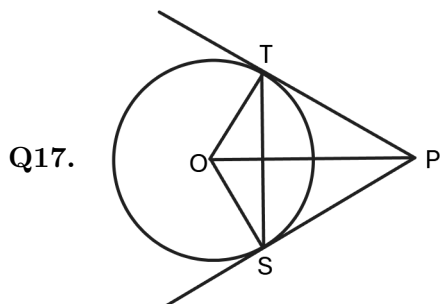
$$\frac{1}{5 + \frac{2}{6 + \frac{4}{1 - \frac{1}{2}}}} = \frac{p}{q}, \quad \text{where } p \text{ and } q \text{ have no common factors, Find } (q - p)$$

Solution: $\frac{1}{5 + \frac{2}{6 + \frac{4}{1 - \frac{1}{2}}}} = \frac{7}{36} \therefore 36 - 7 = 29$. **Ans. 29.**

Q16. The average age of 15 students in a class is 12 years. When three new students with ages 10, 13, and x years join the class, the average age of the students in the class becomes 12.5 years. Find the value of x .

Solution: Old sum: $15 \times 12 = 180$, Newsum: $18 \times 12.5 = 225$

$\therefore x = (225 - 180) - (10 + 13) = 45 - 23 = 22$. **Ans. 22.**



Given is the circle with centre O .

Points T and S lie on the circle.

Rays PT and PS are perpendicular to segments OT and OS respectively. If length OP is two times the radius of the circle, find measure of $\angle OTS$.

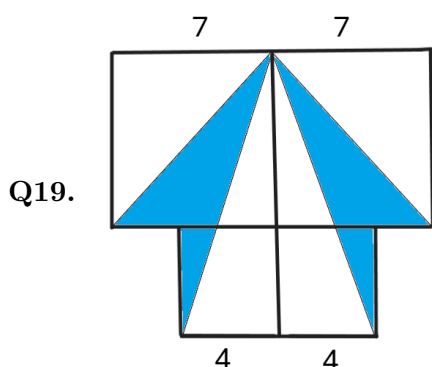
Solution: $\angle OTP = 90^\circ \therefore$ In $\triangle OTP$ by $30-60-90$, $\angle OPT = 30^\circ$, $\angle POT = 60^\circ \therefore \angle OTS = 30^\circ$.
Ans. 30.

Q18. It took a goods train 50 seconds to pass a tunnel that was 1200 m long. It took the same train, 75 seconds to pass a bridge that was 2 km long. At what speed (in metres per second) was the train travelling?

Solution: Equating speeds in both cases

$$\frac{1200 + x}{50} = \frac{2000 + x}{75}$$

$$\Rightarrow x = 400 \Rightarrow \text{speed} = \frac{1600}{50} = 32. \quad \text{Ans. 32.}$$



Find the area of shaded portion, if two squares of 7cm side and two squares of 4cm side are arranged as shown.

Solution:

$$\begin{aligned} \text{Shaded area} &= (7^2 \times 2 + 4^2 \times 2) - 7^2 - \frac{1}{2} \times 8 \times 11 \\ &= (98 + 32) - 49 - 44 = 37. \quad \text{Ans. 37.} \end{aligned}$$

Q20. Three friends A , B and C enjoy collecting stamps. The ratio of the stamps with A and B is $3 : 4$ and that with A & C is $2 : 3$. If C has 153 stamps, how many more stamps does B have than A ?

Solution: We have $A : B : C = 6 : 8 : 9$. 153 stamps correspond to 9 parts. So 1 part = 17, B has 2 parts more than A so 34. **Ans. 34.**

Q21. An NGO has donated some money to an upcoming play-school. The money is sufficient to buy either 35 school bags or 140 water bottles. How many sets comprising of one school bag and one waterbottle together can be bought in that amount?

Solution: $35 : 140 \Rightarrow 1 : 4$. So, if waterbottle costs Re.1, bag costs 4 rupees so $140 \div 5 = 28$ sets. **Ans. 28.**

Q22. K is the average of two numbers A and B .
Find the sum of digits of $500K$, if

$$A = \sqrt{7.29}$$

$$B = \sqrt{\frac{81\% \text{ of } k}{36\% \text{ of } k}}$$

Solution:

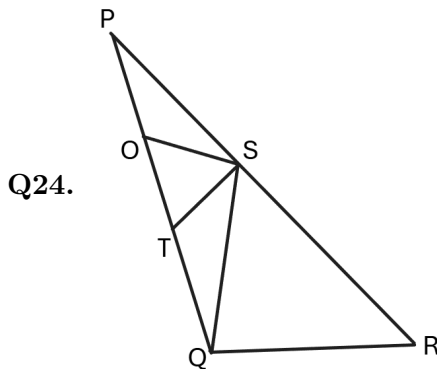
$$A = 2.7, B = \frac{9}{6} = \frac{3}{2}$$

$$K = \frac{2.7 + 1.5}{2} = 2.1$$

$$500K = 1050 \Rightarrow \text{sum of digits is } 6. \quad \textbf{Ans. 6.}$$

Q23. A property of 247 acres is divided among three sisters Gauri, Snehal and Sheetal in the ratio $1/2 : 1/3 : 1/4$. How many acres of land does Sheetal receive?

Solution: Multiplying by the LCM of the denominator ie 12 , distribution will be $6 : 4 : 3$ so $\frac{3}{13} \times 247 = 3 \times 19 = 57$ acres. **Ans. 57.**



In the figure, $\overline{PO} \cong \overline{TO} \cong \overline{SO}$, $\overline{TS} \cong \overline{TQ}$, $\overline{QS} \cong \overline{QR}$. Find $m\angle PRQ$ if $m\angle QST = 36^\circ$.

Solution:

$$\text{Let } \angle PRQ = x, \text{ so } \angle PQR = 2x \Rightarrow \angle P = 180 - 3x$$

$$\Rightarrow \angle TOS = 360 - 6x \Rightarrow \angle OTS = \frac{180 - (360 - 6x)}{2}$$

$$\Rightarrow 3x - 90 \Rightarrow \angle TQS = 1.5x - 45$$

$$\text{Now } \angle SQR = 180 - 2x$$

$$\Rightarrow (1.5x - 45 + 180 - 2x = 2x) \Rightarrow x = 54. \quad \textbf{Ans. 54.}$$

Q25.

$$\text{Solve for } x : \frac{2^{x+3}}{2^{1-x}} \times 2^x = (128)^5$$

Solution:

$$2^{x+3+x-1+x} = (2^7)^5$$

$$3x + 2 = 35$$

$$x = 11 \quad \textbf{Ans. 11.}$$

Q26. A person buys a mobile phone for Rs.10,000 and sells it at a 15% profit. He then buys a tablet with the total money earned and sells it at a 20% profit. Calculate the overall profit percentage.

Solution:

$$10000 \times 1.15 \times 1.2 = 13800$$

$$\text{so } \frac{3800}{10,000} \times 100 = 38\% \text{ profit.} \quad \textbf{Ans. 38.}$$

Q27. If $a = 73, b = 27$, find the value of

$$\left[\frac{a^2 - 2ab + b^2}{a + b} \times \frac{a^2 + 2ab + b^2}{a - b} \right] \div (a + b)$$

Solution:

$$\frac{(a-b)^2 \times (a+b)^2}{a^2 - b^2} \times \frac{1}{(a+b)} = a - b = 46 \quad \text{Ans. 46.}$$

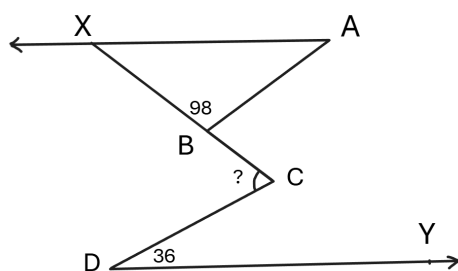
Q28. The complement of a certain angle is 4 times the angle. Find K , if the measure of its supplementary angle is $(90 + K)^\circ$

Solution:

$$90 - x = 4x \Rightarrow \text{angle } x = 18$$

$$\therefore 180 - 18 = 90 + K \Rightarrow 72 = K. \quad \text{Ans. 72.}$$

Q29.



Given:

$\overrightarrow{AX}$ parallel to $\overrightarrow{DY}$, $\overline{BX} \cong \overline{BA}$

$m\angle XBA = 98^\circ$, $m\angle CDY = 36^\circ$,

points $X - B - C$ are collinear.

Find: $m\angle BCD$

Solution:

$$\angle XCD = x + 36$$

$$x = \angle AXC = \frac{180 - 98}{2} = 90 - 49 = 41$$

$$\Rightarrow \angle XCD = 77. \quad \text{Ans. 77.}$$

Q30. In a 200 metre race, Arun beats Varun by 35 metres or 7 seconds. Find the time taken by Arun to complete the race.

Solution: Arun beats Varun by 35 metres or 7 seconds Distance given = 200 m.

$$35 \text{ m} = 7 \text{ sec} \Rightarrow 1 \text{ sec} = 5 \text{ m}$$

Varun's speed is 5 m/sec.

Time taken by Arun to complete the race = $40 - 7 = 33$ seconds. **Ans. 33.**