# XAT Quantitative Ability & DI

## Sample Paper – 9

**Duration: 64 Minutes** **Maximum Marks: 28**

### Instructions

- This paper contains **28** Multiple Choice Questions (Single Correct Answer), modelled on the Quantitative Ability & Data Interpretation section of **XAT** (Xavier Aptitude Test), conducted by XLRI.
- Each correct answer carries **+1 mark**, with **0.25 marks deducted** for every incorrect answer. (In the actual XAT you may leave up to **8** questions across Part 1 unattempted without penalty; thereafter each blank costs **0.10** marks.)
- **Section A** has **20** standalone Quantitative Ability questions; **Section B** has **two Data Interpretation sets** of four questions each.
- **No calculator is allowed** in XAT; do all working by hand. Attempt this practice paper in one timed sitting of about **64 minutes**.
- Use of mobile phones and electronic gadgets is strictly prohibited.

## Section A: Quantitative Ability

**Q1.** A trader marks his goods 50% above the cost price and then allows a discount of 20% on the marked price. His profit percent is:

(A) 20%

(B) 30%

(C) 25%

(D) 15%

**Q2.** A dealer sells two watches at Rs. 1200 each. On one he gains 20% and on the other he loses 20%. Overall he makes:

(A) a gain of 4%

(B) no profit and no loss

(C) a loss of 4%

(D) a loss of 2%

**Q3.** A train 220 m long crosses a platform 280 m long in 25 seconds. The speed of the train is:

(A) 72 km/h

(B) 60 km/h

(C) 80 km/h

(D) 65 km/h

**Q4.** $A$ can finish a piece of work in 15 days and $B$ in 10 days. Working together, they will finish it in:

(A) 5 days

(B) 6 days

(C) 12.5 days

(D) 8 days

**Q5.** The average of 9 numbers is 40. The average of the first five is 38 and that of the last five is 44. The fifth number is:

(A) 50

(B) 45

(C) 42

(D) 40

**Q6.** A 60-litre mixture contains milk and water in the ratio $5:1$. How much water must be added so that the ratio becomes $5:2$?

(A) 10 litres

(B) 5 litres

(C) 15 litres

(D) 12 litres

**Q7.** The difference between the compound interest and the simple interest on a sum for 2 years at 5% per annum is Rs. 40. The sum is:

(A) Rs. 8000

(B) Rs. 20000

(C) Rs. 16000

(D) Rs. 12000

**Q8.** If $x - \frac{1}{x} = 3$, then $x^2 + \frac{1}{x^2}$ equals:

(A) 9

(B) 7

(C) 13

(D) 11

**Q9.** The sum of the first 15 terms of the arithmetic progression $5, 9, 13, \ldots$ is:

(A) 480

(B) 510

(C) 495

(D) 500

**Q10.** The roots of the equation $x^2 - 7x + 12 = 0$ are:

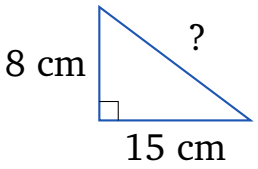
(A) 2 and 6

(B) 3 and 4

(C) $-3$ and $-4$

(D) 3 and $-4$

**Q11.** In the right-angled triangle shown, the two legs measure 8 cm and 15 cm. The length of the hypotenuse is:



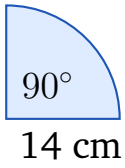

(A) 23 cm

(B) 20 cm

(C) 21 cm

(D) 17 cm

**Q12.** A sector of a circle of radius 14 cm subtends an angle of $90^\circ$ at the centre. Its area is (take $\pi = \frac{22}{7}$):




(A) 308 $cm^2$

(B) 196 $cm^2$

(C) 77 $cm^2$

(D) 154 $cm^2$

**Q13.** The volume of a cube is 343 $cm^3$. Its total surface area is:

(A) 196 $cm^2$

(B) 343 $cm^2$

(C) 294 $cm^2$

(D) 252 $cm^2$

**Q14.** The remainder when $3^{101}$ is divided by 5 is:

(A) 1

(B) 3

(C) 4

(D) 2

**Q15.** The number of positive factors of 420 is:

(A) 20

(B) 24

(C) 18

(D) 28

**Q16.** The number of distinct arrangements of all the letters of the word **APPLE** is:

(A) 60

(B) 120

(C) 30

(D) 24

**Q17.** Two fair dice are thrown together. The probability that the sum of the numbers shown is 6 is:

(A) $\frac{1}{6}$

(B) $\frac{1}{9}$

(C) $\frac{1}{12}$

(D) $\frac{5}{36}$

**Q18.** If $\log_3 x = 4$, then $x$ equals:

(A) 81

(B) 64

(C) 27

(D) 12

**Q19.** $A$'s salary is 20% more than $B$'s salary. By what percent is $B$'s salary less than $A$'s?

(A) $16\frac{2}{3}\%$

(B) 20%

(C) 25%

(D) 15%

**Q20.** If $5x - 3 > 3x + 9$, then:

(A) $x < 6$

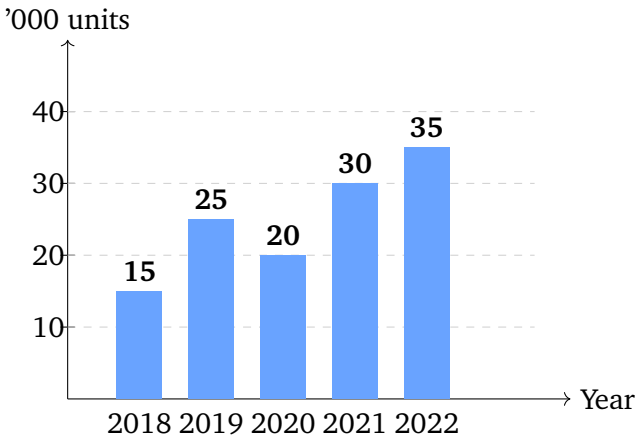
(B) $x > 3$

(C) $x < 9$

(D) $x > 6$

## Section B: Data Interpretation – Set I

*Directions (Q21–Q24): The bar chart shows the number of smartphones sold (in thousands) by a retail store from 2018 to 2022. Study it and answer the questions.*




**Q21.** What is the total number of smartphones sold by the store over the five years (in thousands)?

(A) 115

(B) 135

(C) 125

(D) 130

**Q22.** The sales in 2021 are what percent more than the sales in 2020?

(A) 40%

(B) 50%

(C) $33\frac{1}{3}\%$

(D) 20%

**Q23.** What is the average annual sales over the five years (in thousands)?

(A) 20

(B) 30

(C) 25

(D) 28

**Q24.** In which year were the sales exactly equal to the five-year average?

(A) 2018

(B) 2019

(C) 2020

(D) 2022

## Section B: Data Interpretation – Set II

*Directions (Q25–Q28): The table shows the number of books issued by four libraries in Week 1 and Week 2. Study it and answer the questions.*

| Library | Week 1 | Week 2 | Total |
|---|---|---|---|
| W | 30 | 50 | 80 |
| X | 60 | 40 | 100 |
| Y | 45 | 35 | 80 |
| Z | 55 | 75 | 130 |

**Q25.** What is the total number of books issued by all four libraries over the two weeks?

(A) 360

(B) 370

(C) 380

(D) 390

**Q26.** Library Z's two-week total is what percent more than Library W's two-week total?

(A) 40%

(B) 50%

(C) 55%

(D) 62.5%

**Q27.** What is the average two-week total per library?

(A) 90

(B) 95

(C) 97.5

(D) 100

**Q28.** By how many books did the total Week 2 issues exceed the total Week 1 issues?

(A) 5

(B) 10

(C) 15

(D) 20

## Detailed Solutions

### Q1.

**Solution**

**Concept – successive markup and discount.**

**Step 1:** Let CP $= 100$. Marked price $= 100 + 50\% = 150$.

**Step 2:** Selling price $= 150 \times (1 - 0.20) = 150 \times 0.80 = 120$.

**Step 3:** Profit $= 120 - 100 = 20$, so profit percent $= 20\%$.

**Why the others are wrong:** 30%/15% come from forgetting the discount or subtracting 20% from 50%; 25% mis-chains the factors. The correct chained value is 20%.

**Final Answer:** A

**Answer: (A)** Go Back to Q1

### Q2.

**Solution**

**Concept – equal SP, equal opposite %: always a loss.**

**Step 1:** CP of the gaining watch $= \dfrac{1200}{1.2} = 1000$; CP of the losing one $= \dfrac{1200}{0.8} = 1500$.

**Step 2:** Total CP $= 2500$, total SP $= 2400$, loss $= 100$.

**Step 3:** Loss percent $= \dfrac{100}{2500} \times 100 = 4\%$ (matches the shortcut $\dfrac{20^2}{100}\% = 4\%$ loss).

**Why the others are wrong:** There is always a net loss here, so A and B fail; the loss is 4%, not 2%.

**Final Answer:** C

**Answer: (C)** Go Back to Q2

### Q3.

**Solution**

**Concept – crossing a platform covers (train + platform) length.**

**Step 1:** Distance $= 220 + 280 = 500$ m in 25 s.

**Step 2:** Speed $= \dfrac{500}{25} = 20$ m/s.

**Step 3:** $20 \times \dfrac{18}{5} = 72$ km/h.

**Why the others are wrong:** 60/80/65 use a wrong distance or a wrong m/s-to-km/h factor.

**Final Answer:** A

**Answer: (A)** Go Back to Q3

## Q4.

### Solution

**Concept – combined one-day work.**

**Step 1:** $\frac{1}{15}+\frac{1}{10}=\frac{2+3}{30}=\frac{5}{30}=\frac{1}{6}$ per day.

**Step 2:** Time $=\frac{6}{1}=6$ days.

**Why the others are wrong:** 5 and 12.5 ignore the correct LCM combination; 8 adds a wrong share.

**Final Answer:** B

**Answer: (B)** Go Back to Q4

## Q5.

### Solution

**Concept – overlap in averages.**

**Step 1:** Sum of all $9 = 9 \times 40 = 360$.

**Step 2:** Sum of first five $= 5 \times 38 = 190$; sum of last five $= 5 \times 44 = 220$; their sum $= 410$.

**Step 3:** The fifth number is counted in both, so it $= 410 - 360 = 50$.

**Why the others are wrong:** 45/42/40 ignore the double-counted fifth term.

**Final Answer:** A

**Answer: (A)** Go Back to Q5

## Q6.

### Solution

**Concept – only water changes; milk stays fixed.**

**Step 1:** Milk $=\frac{5}{6}\times 60=50$, water $=10$.

**Step 2:** For $5:2$ with milk $=50$: water $=50\times\frac{2}{5}=20$.

**Step 3:** Water to add $= 20 - 10 = 10$ litres.

**Why the others are wrong:** 5/15/12 come from changing milk or mis-setting the target ratio.

**Final Answer:** A

**Answer: (A)** Go Back to Q6

## Q7.

### Solution

**Concept – for 2 years, CI − SI** $= P\left(\frac{r}{100}\right)^2$.

**Step 1:** $P \times (0.05)^2 = 0.0025P = 40$.

**Step 2:** $P = \frac{40}{0.0025} = 16000$.

**Why the others are wrong:** 8000/20000/12000 do not satisfy $0.0025P = 40$.

**Final Answer:** C

**Answer: (C)** Go Back to Q7

## Q8.

### Solution

**Concept – square the given expression.**

**Step 1:** $\left(x - \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} - 2 = 9$.

**Step 2:** $x^2 + \frac{1}{x^2} = 9 + 2 = 11$.

**Why the others are wrong:** 9 forgets the $+2$; 7 subtracts instead of adding; 13 mis-squares.

**Final Answer:** D

**Answer: (D)** Go Back to Q8

## Q9.

### Solution

**Concept – AP sum** $S_n = \frac{n}{2}[2a + (n-1)d]$.

**Step 1:** $a = 5$, $d = 4$, $n = 15$.

**Step 2:** $S_{15} = \frac{15}{2}[10 + 14 \times 4] = \frac{15}{2}[10 + 56] = \frac{15}{2} \times 66 = 495$.

**Why the others are wrong:** 480/510/500 use a wrong $n-1$ or $d$.

**Final Answer:** C

**Answer: (C)** Go Back to Q9

## Q10.

### Solution

**Concept – factor the quadratic.**

**Step 1:** $x^2 - 7x + 12 = (x-3)(x-4)$.

**Step 2:** Roots are $x = 3$ and $x = 4$ (both positive, product 12, sum 7).

**Why the others are wrong:** A has the wrong product; C/D have wrong signs.

**Final Answer:** B

**Answer: (B)** Go Back to Q10

## Q11.

### Solution

**Concept – Pythagoras theorem.**

**Step 1:** Hypotenuse $= \sqrt{8^2 + 15^2} = \sqrt{64 + 225}$.

**Step 2:** $= \sqrt{289} = 17$ cm (the 8-15-17 Pythagorean triple).

**Why the others are wrong:** 23 adds the legs; 20 and 21 do not satisfy Pythagoras.

**Final Answer:** D

**Answer: (D)** Go Back to Q11

## Q12.

### Solution

**Concept – sector area** $= \dfrac{\theta}{360}\,\pi r^2$.

**Step 1:** $\dfrac{90}{360} = \dfrac{1}{4}$; $\pi r^2 = \dfrac{22}{7} \times 196 = 616$.

**Step 2:** Area $= \dfrac{1}{4} \times 616 = 154$ cm$^2$.

**Why the others are wrong:** 616 (option not listed) is the full circle; 308 is a semicircle; 196 is $r^2$; 77 halves the wrong figure.

**Final Answer:** D

**Answer: (D)** Go Back to Q12

## Q13.

### Solution

**Concept – cube: volume** $= a^3$**, TSA** $= 6a^2$**.**

**Step 1:** $a^3 = 343 \Rightarrow a = 7$ cm.

**Step 2:** TSA $= 6 \times 7^2 = 6 \times 49 = 294$ cm$^2$.

**Why the others are wrong:** 196/343/252 use a wrong side or wrong face count.

**Final Answer:** C

**Answer: (C)** Go Back to Q13

## Q14.

### Solution

**Concept – cyclicity of** $3^n \bmod 5$**.**

**Step 1:** The powers of 3 mod 5 cycle as $3, 4, 2, 1$ with period 4.

**Step 2:** $101 = 4 \times 25 + 1$, so $3^{101}$ sits at position 1 of the cycle $\equiv 3 \pmod 5$.

**Why the others are wrong:** 1/4/2 correspond to other positions (4th, 2nd, 3rd) in the cycle.

**Final Answer:** B

**Answer: (B)** Go Back to Q14

## Q15.

### Solution

**Concept – number of factors from prime factorisation.**

**Step 1:** $420 = 2^2 \times 3^1 \times 5^1 \times 7^1$.

**Step 2:** Number of factors $= (2+1)(1+1)(1+1)(1+1) = 3 \times 2 \times 2 \times 2 = 24$.

**Why the others are wrong:** 20/18/28 drop a prime or mis-add an exponent.

**Final Answer:** B

**Answer: (B)** Go Back to Q15

## Q16.

**Solution**

**Concept – arrangements with a repeated letter.**

**Step 1:** APPLE has 5 letters with P repeated twice.

**Step 2:** Arrangements $= \frac{5!}{2!} = \frac{120}{2} = 60$.

**Why the others are wrong:** 120 ignores the repeat; 30/24 over-divide.

**Final Answer:** A

**Answer: (A)** Go Back to Q16

## Q17.

**Solution**

**Concept – favourable outcomes over 36.**

**Step 1:** Sum 6: $(1,5),(2,4),(3,3),(4,2),(5,1) = 5$ ways.

**Step 2:** Probability $= \frac{5}{36}$.

**Why the others are wrong:** $\frac{1}{6}, \frac{1}{9}, \frac{1}{12}$ miscount the favourable pairs.

**Final Answer:** D

**Answer: (D)** Go Back to Q17

## Q18.

**Solution**

**Concept – definition of a logarithm.**

**Step 1:** $\log_3 x = 4 \Rightarrow x = 3^4$.

**Step 2:** $x = 81$.

**Why the others are wrong:** 64/27/12 come from wrong bases or exponents.

**Final Answer:** A

**Answer: (A)** Go Back to Q18

## Q19.

**Solution**

**Concept – the base changes when comparing the other way.**

**Step 1:** Let $B = 100$, so $A = 120$.

**Step 2:** $B$ is less than $A$ by $\dfrac{120-100}{120} \times 100 = \dfrac{20}{120} \times 100 = 16\frac{2}{3}\%$.

**Why the others are wrong:** 20% keeps the wrong base; 25%/15% mis-divide.

**Final Answer:** A

**Answer: (A)** Go Back to Q19

## Q20.

**Solution**

**Concept – solve the linear inequality.**

**Step 1:** $5x - 3 > 3x + 9 \Rightarrow 5x - 3x > 9 + 3$.

**Step 2:** $2x > 12 \Rightarrow x > 6$.

**Why the others are wrong:** the inequality direction and constant give $x > 6$, not the others.

**Final Answer:** D

**Answer: (D)** Go Back to Q20

## Q21.

**Solution**

**Concept – add the bar heights.**

**Step 1:** $15 + 25 + 20 + 30 + 35$.

**Step 2:** $= 125$ thousand units.

**Why the others are wrong:** 115/135/130 drop or mis-add a year's bar.

**Final Answer:** C

**Answer: (C)** Go Back to Q21

## Q22.

**Solution**

**Concept – percent increase over the earlier year.**

**Step 1:** 2021 $= 30$, 2020 $= 20$; increase $= 10$.

**Step 2:** $\frac{10}{20} \times 100 = 50\%$.

**Why the others are wrong:** $33\frac{1}{3}\%$ divides by 30; 40%/20% use wrong figures.

**Final Answer:** B

**Answer: (B)** Go Back to Q22

## Q23.

**Solution**

**Concept – average = total ÷ count.**

**Step 1:** Total $= 125$ (from Q21), count $= 5$.

**Step 2:** Average $= \frac{125}{5} = 25$ thousand units.

**Why the others are wrong:** 20/30/28 do not equal $125 \div 5$.

**Final Answer:** C

**Answer: (C)** Go Back to Q23

## Q24.

**Solution**

**Concept – match a year to the average of 25.**

**Step 1:** The five values are $15, 25, 20, 30, 35$; the average is $25$.

**Step 2:** The year with sales exactly $25$ is **2019**.

**Why the others are wrong:** 2018/2020/2022 read $15$, $20$, $35$, none equal to 25.

**Final Answer:** B

**Answer: (B)** Go Back to Q24

## Q25.

**Solution**

**Concept – add the "Total" column.**

**Step 1:** $80 + 100 + 80 + 130$.

**Step 2:** $= 390$ books.

**Why the others are wrong:** 360/370/380 drop part of a library's total.

**Final Answer:** D

**Answer: (D)** Go Back to Q25

## Q26.

**Solution**

**Concept – percent more relative to the smaller total.**

**Step 1:** Z $= 130$, W $= 80$; difference $= 50$.

**Step 2:** $\frac{50}{80} \times 100 = 62.5\%$.

**Why the others are wrong:** 40%/50%/55% divide by a wrong base or drop the difference.

**Final Answer:** D

**Answer: (D)** Go Back to Q26

## Q27.

**Solution**

**Concept – average two-week total = grand total ÷ number of libraries.**

**Step 1:** Grand total $= 390$ (from Q25), count $= 4$.

**Step 2:** Average $= \frac{390}{4} = 97.5$ books.

**Why the others are wrong:** 90/95/100 do not equal $390 \div 4$.

**Final Answer:** C

**Answer: (C)** Go Back to Q27

## Q28.

**Solution**

**Concept – column sums for each week.**

**Step 1:** Week $1 = 30 + 60 + 45 + 55 = 190$; Week $2 = 50 + 40 + 35 + 75 = 200$.

**Step 2:** Difference $= 200 - 190 = 10$ books.

**Why the others are wrong:** 5/15/20 come from a mis-added column.

**Final Answer:** B

**Answer: (B)** Go Back to Q28

# Answer Key

| Q | Ans | Q | Ans | Q | Ans | Q | Ans | Q | Ans |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 2 | C | 3 | A | 4 | B | 5 | A |
| 6 | A | 7 | C | 8 | D | 9 | C | 10 | B |
| 11 | D | 12 | D | 13 | C | 14 | B | 15 | B |
| 16 | A | 17 | D | 18 | A | 19 | A | 20 | D |
| 21 | C | 22 | B | 23 | C | 24 | B | 25 | D |
| 26 | D | 27 | C | 28 | B | | | | |