TANCET — Quantitative Aptitude
Sample Paper 7

Tamil Nadu Common Entrance Test | Collegedunia Practice Series

Questions	Maximum Marks	Duration	Marking Scheme
20	20	24 minutes	$+1$ correct, $-\frac{1}{4}$ wrong, 0 unattempted

Instructions

- All questions carry **1 mark** each. There is a negative marking of $-\frac{1}{4}$ for each wrong answer.
- Choose the **single best answer** from the four options (A)–(D).
- Unattempted questions carry **zero** marks.
- Do not spend more than **72 seconds** per question on average.
- Rough work may be done in the space provided in the answer booklet.

Quantitative Aptitude — 20 Questions

Q1. How many positive divisors does 360 have?

(A) 12

(B) 24

(C) 18

(D) 36

Q2. How many trailing zeros does $25!$ have?

(A) 4

(B) 5

(C) 6

(D) 8

Q3. Five years ago, the ratio of ages of A and B was $3 : 4$. Five years from now, the ratio of their ages will be $5 : 6$. Find B's present age.

(A) 20 years

(B) 22 years

(C) 24 years

(D) 25 years

Q4. Solve $|2x - 5| = 9$. What is the positive solution?

(A) 7

(B) -2

(C) 4

(D) 3

Q5. What percentage of 60 is 45?

(A) 70%

(B) 75%

(C) 80%

(D) 65%

Q6. After a 20% increase and then a 10% decrease, the final price of an article is Rs. 864. Find the original price.

(A) Rs. 750

(B) Rs. 780

(C) Rs. 800

(D) Rs. 900

Q7. 12 workers can finish a job in 15 days. How many days will 9 workers take to complete the same job, working at the same rate?

(A) 10 days

(B) 12 days

(C) 18 days

(D) 20 days

Q8. An alloy of gold and silver contains 60% gold. How many grams of pure gold must be added to 50 g of the alloy to make it 80% gold?

(A) 50 g

(B) 40 g

(C) 30 g

(D) 60 g

Q9. The average of 10 numbers is 15. Later it is found that one number was read as 26 instead of 62. What is the correct average?

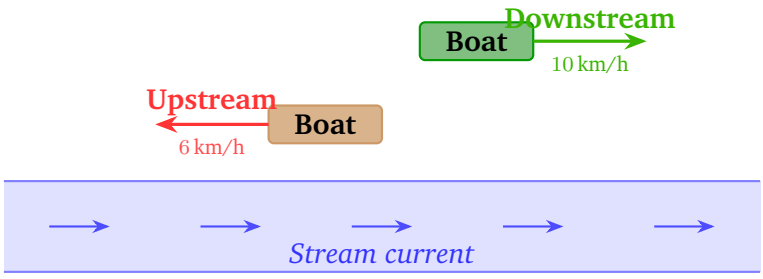
(A) 18

(B) 18.6

(C) 19

(D) 19.2

Q10. A boat travels 30 km upstream in 5 hours and 30 km downstream in 3 hours. Find the speed of the stream.



$$\text{Stream speed} = \frac{\text{Downstream} - \text{Upstream}}{2} = \frac{10-6}{2} = 2\,\text{km/h}$$

(A) 1 km/h

(B) 1.5 km/h

(C) 2 km/h

(D) 3 km/h

Q11. A person travels 360 km at 60 km/h, then rests for 1 hour, and then travels 180 km at 90 km/h. What is the total time taken?

(A) 6 h

(B) 7 h

(C) 8 h

(D) 9 h

Q12. A is 50% more efficient than B. B alone can complete a task in 12 days. In how many days can A and B together complete the task?

(A) 4.8 days

(B) 5 days

(C) 6 days

(D) 4 days

Q13. Pipe A can fill a tank in 8 hours and Pipe B can fill it in 12 hours. Both pipes are opened simultaneously. After 4 hours, Pipe B is closed. How much additional time does Pipe A need to fill the remaining tank?

(A) 1 hour

(B) 80 minutes

(C) 2 hours

(D) 90 minutes

Q14. A trader uses a weight of 900 g instead of 1 kg. What is his percentage gain?

(A) 9%

(B) 10%

(C) 11.11%

(D) 12.5%

Q15. Find the compound interest on Rs. 10,000 at 10% per annum, compounded half-yearly, for 1 year.

(A) Rs. 950

(B) Rs. 975

(C) Rs. 1,000

(D) Rs. 1,025

Q16. Find the sum of all even numbers from 2 to 50.

(A) 650

(B) 600

(C) 700

(D) 625

Q17. In a geometric progression with first term $a = 3$ and common ratio $r = 2$, find the ratio of the sum of the first 4 terms to the sum of the first 8 terms.

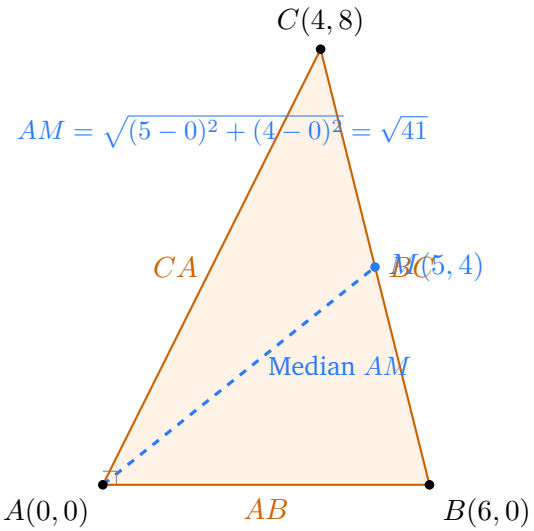
(A) $1 : 15$

(B) $1 : 17$

(C) $1 : 16$

(D) $3 : 17$

Q18. In triangle ABC with vertices $A(0,0)$, $B(6,0)$, and $C(4,8)$, find the length of the median from A to the midpoint M of BC.



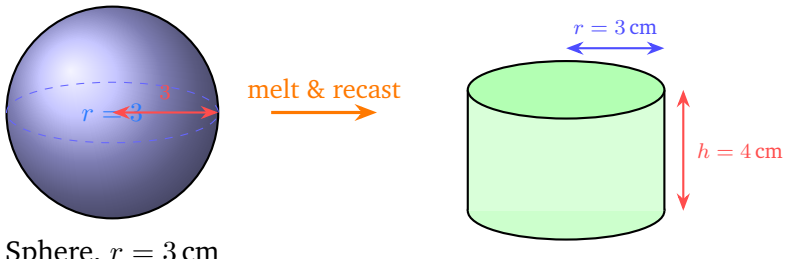
(A) 5

(B) 6

(C) $\sqrt{41}$

(D) $\sqrt{45}$

Q19. A metallic sphere of radius 3 cm is melted and recast into a cylinder of radius 3 cm. Find the height of the cylinder.



$$\frac{4}{3}\pi(3)^3 = \pi(3)^2 h \;\Rightarrow\; 36\pi = 9\pi h \;\Rightarrow\; h = 4\,\text{cm}$$

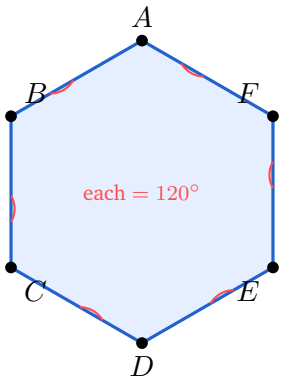
(A) 2 cm

(B) 3 cm

(C) 6 cm

(D) 4 cm

Q20. Find the sum of the interior angles of a regular hexagon.



Sum $= (6-2) \times 180^\circ = 4 \times 180^\circ = \mathbf{720}^\circ$

(A) 720°

(B) 540°

(C) 900°

(D) 1080°

Detailed Solutions

Q1. *Number System — Number of factors*

Solution

$360 = 2^3 \times 3^2 \times 5^1$

Number of divisors $= (3+1)(2+1)(1+1) = 4 \times 3 \times 2 = \mathbf{24}$

Answer: (B)

Q2. *Number System — Trailing zeros in factorial*

Solution

Trailing zeros in $n!$ come from factors of 5 (since 2s are plentiful).

$$\left\lfloor \frac{25}{5} \right\rfloor + \left\lfloor \frac{25}{25} \right\rfloor = 5 + 1 = \mathbf{6}$$

Answer: (C)

Q3. *Algebra — Age problem*

Solution

Let k be a multiplier. Five years ago: ages of A and B were $3k$ and $4k$.
Present ages: $A = 3k + 5$, $B = 4k + 5$.

Five years from now:

$$\frac{3k+10}{4k+10} = \frac{5}{6} \implies 6(3k{+}10) = 5(4k{+}10) \implies 18k{+}60 = 20k{+}50 \implies 2k = 10 \implies k = 5$$

B's present age $= 4(5) + 5 = \mathbf{25}$ years.

Answer: (D)

Q4. *Algebra — Modulus equation*

Solution

$|2x - 5| = 9$ gives two cases:

Case 1: $2x - 5 = 9 \Rightarrow 2x = 14 \Rightarrow x = 7$

Case 2: $2x - 5 = -9 \Rightarrow 2x = -4 \Rightarrow x = -2$

The positive solution is **7**.

Answer: (A)

Q5. *Percentages — Fraction to percent*

Solution

$$\frac{45}{60} \times 100 = \frac{4500}{60} = \mathbf{75\%}$$

Answer: (B)

Q6. *Percentages — Finding original price*

Solution

Let the original price be P.

After 20% increase: price $= 1.20P$.

After 10% decrease: price $= 1.20P \times 0.90 = 1.08P$.

$$1.08P = 864 \implies P = \frac{864}{1.08} = \mathbf{Rs.\,800}$$

Answer: (C)

Q7. *Ratio & Proportion — Inverse proportion*

Solution

Workers and days are inversely proportional.

$$12 \times 15 = 9 \times d \implies d = \frac{180}{9} = \mathbf{20}\text{ days}$$

Answer: (D)

Q8. *Mixtures — Gold alloy*

Solution

Initial gold in $50\,\text{g}$ alloy $= 0.60 \times 50 = 30\,\text{g}$.

Let $x\,\text{g}$ of pure gold be added:

$$\frac{30+x}{50+x} = 0.80 \implies 30 + x = 40 + 0.8x \implies 0.2x = 10 \implies x = \mathbf{50\,g}$$

Answer: (A)

Q9. *Averages — Incorrect reading*

Solution

Original sum $= 10 \times 15 = 150$.

Error: 26 was recorded instead of 62; difference $= 62 - 26 = 36$.

Correct sum $= 150 + 36 = 186$.

Correct average $= \dfrac{186}{10} = \mathbf{18.6}$

Answer: (B)

Q10. *TSD — River current*

Solution

Upstream speed $= \dfrac{30}{5} = 6\,\text{km/h}$.

Downstream speed $= \dfrac{30}{3} = 10\,\text{km/h}$.

$$\text{Speed of stream} = \frac{\text{Downstream} - \text{Upstream}}{2} = \frac{10 - 6}{2} = \mathbf{2}\,\text{km/h}$$

Answer: (C)

Q11. *TSD — Journey with rest*

Solution

$$\text{Time for first part} = \frac{360}{60} = 6\,\text{h}$$
$$\text{Rest time} = 1\,\text{h}$$
$$\text{Time for second part} = \frac{180}{90} = 2\,\text{h}$$
$$\text{Total time} = 6 + 1 + 2 = \mathbf{9}\,\text{h}$$

Answer: (D)

Q12. *Work & Time — 50% more efficient*

Solution

A is 50% more efficient than B.

B's rate $= \dfrac{1}{12}$ per day. A's rate $= \dfrac{1.5}{12} = \dfrac{1}{8}$ per day.

$$\text{Combined rate} = \frac{1}{8} + \frac{1}{12} = \frac{3}{24} + \frac{2}{24} = \frac{5}{24} \text{ per day}$$

$$\text{Days together} = \frac{24}{5} = \mathbf{4.8} \text{ days}$$

Answer: (A)

Q13. *Pipes & Cisterns — One pipe closed*

Solution

Combined rate of A and B $= \dfrac{1}{8} + \dfrac{1}{12} = \dfrac{3+2}{24} = \dfrac{5}{24}$ per hour.

Work done in 4 hours $= 4 \times \dfrac{5}{24} = \dfrac{20}{24} = \dfrac{5}{6}$.

Remaining work $= 1 - \dfrac{5}{6} = \dfrac{1}{6}$.

Time for A alone to finish $= \dfrac{1/6}{1/8} = \dfrac{8}{6} = \dfrac{4}{3}$ h $= \dfrac{4}{3} \times 60 = \mathbf{80}$ min.

Answer: (B)

Q14. *Profit & Loss — False weight*

Solution

The trader gives 900 g but charges for 1000 g.

$$\text{Gain\%} = \frac{1000 - 900}{900} \times 100 = \frac{100}{900} \times 100 = \frac{100}{9} \approx \mathbf{11.11}\%$$

Answer: (C)

Q15. *Compound Interest — Half-yearly*

Solution

Principal $P =$ Rs. 10,000, rate $= 10\%$ p.a., compounded half-yearly.

Rate per half-year $= 5\%$, number of periods $n = 2$.

$$A = 10{,}000 \times \left(1 + \frac{5}{100}\right)^2 = 10{,}000 \times (1.05)^2 = 10{,}000 \times 1.1025 = \text{Rs. } 11{,}025$$

$$\text{CI} = 11{,}025 - 10{,}000 = \text{Rs. } 1{,}025$$

Answer: (D)

Q16. *Arithmetic Progression — Sum of even numbers*

Solution

Even numbers from 2 to 50 form an AP: $2, 4, 6, \ldots, 50$.

Number of terms $n = \dfrac{50 - 2}{2} + 1 = 25$.

$$S = \frac{n}{2}(a + l) = \frac{25}{2}(2 + 50) = \frac{25}{2} \times 52 = 25 \times 26 = \mathbf{650}$$

Answer: (A)

Q17. *Geometric Progression — Ratio of sums*

Solution

$a = 3$, $r = 2$.

$$S_n = a\,\frac{r^n - 1}{r - 1} = 3(2^n - 1)$$

$$S_4 = 3(2^4 - 1) = 3 \times 15 = 45$$

$$S_8 = 3(2^8 - 1) = 3 \times 255 = 765$$

$$\frac{S_4}{S_8} = \frac{45}{765} = \frac{1}{17} \quad \Longrightarrow \quad \mathbf{1 : 17}$$

Answer: (B)

Q18. *Geometry — Median of a triangle*

Solution

Vertices: $A(0,0)$, $B(6,0)$, $C(4,8)$.

Midpoint of BC:

$$M = \left(\frac{6+4}{2},\ \frac{0+8}{2}\right) = (5,\ 4)$$

Length of median AM:

$$AM = \sqrt{(5-0)^2 + (4-0)^2} = \sqrt{25+16} = \sqrt{\mathbf{41}}$$

Answer: (C)

Q19. *Mensuration — Volume of sphere recast into cylinder*

Solution

Volume of sphere $= \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(3)^3 = \frac{4}{3}\pi \times 27 = 36\pi\ \text{cm}^3$.

Volume of cylinder $= \pi R^2 h = \pi(3)^2 h = 9\pi h$.

Setting volumes equal:

$$9\pi h = 36\pi \implies h = \frac{36}{9} = \mathbf{4}\,\text{cm}$$

Answer: (D)

Q20. *Geometry — Sum of interior angles of a hexagon*

Solution

For a polygon with n sides, sum of interior angles $= (n-2) \times 180^\circ$.

For a hexagon ($n = 6$):

$$\text{Sum} = (6-2) \times 180^\circ = 4 \times 180^\circ = \mathbf{720}^\circ$$

Answer: (A)

Answer Key

Quick Answer Reference:

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	5	B	9	B	13	B	17	B
2	C	6	C	10	C	14	C	18	C
3	D	7	D	11	D	15	D	19	D
4	A	8	A	12	A	16	A	20	A

Marking Scheme Reminder

- **Correct answer:** $+1$ mark
- **Wrong answer:** $-\frac{1}{4}$ mark (negative marking)
- **Unattempted:** 0 marks
- **Maximum score:** 20 marks **Duration:** 24 minutes

Topic-wise Distribution

Topic	Questions	Answers
Number System	Q1, Q2	B, C
Algebra	Q3, Q4	D, A
Percentages	Q5, Q6	B, C
Ratio & Proportion / Mixtures	Q7, Q8	D, A
Averages	Q9	B
Time, Speed & Distance	Q10, Q11	C, D
Work & Time / Pipes & Cisterns	Q12, Q13	A, B
Profit & Loss	Q14	C
Compound Interest	Q15	D
Arithmetic Progression	Q16	A
Geometric Progression	Q17	B
Geometry (Coordinate)	Q18	C
Mensuration	Q19	D
Geometry (Polygons)	Q20	A

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