Practice Test-6

1. The cost of cultivating a square field at the rate of Rs. 135 per hectare is Rs. 1,215. What is the cost of fencing the same field if the rate of fencing is 75 paise per metre?

   (Given: 1 hectare = 10,000 sq. m)

   (a) Rs. 810   (b) Rs. 900

   (c) Rs. 1,800   (d) None of these

2. Two trains start from A and B, and head towards B and A respectively. Train from A starts at 11 p.m. and reaches B at 5 p.m. next day. Train from B starts at 10 p.m. the same day and reaches A at 6 a.m. the next day. At what time (approximately) will they cross each other?

   (a) 4 a.m.   (b) 3.51 a.m.

   (c) 2 a.m.   (d) 1.30 a.m.

3. The area of a parallelogram ABCD is A sq. cm. The distance between AB and DC is d_1 cm and the distance between BC and AD is d_2 cm. Then the perimeter of the parallelogram is

   (a) $\dfrac{2A(d_1 + d_2)}{d_1 d_2}$ (b) $\dfrac{2A(d_1 d_2)}{d_1 + d_2}$

   (c) $\dfrac{A d_1 d_2}{d_1 + d_2}$ (d) $\dfrac{A(d_1 + d_2)}{d_1 d_2}$

4. Two cars are driven by A and B respectively. They are 580 miles apart and they drive towards each other. A's car had travelled 20 miles an hour, 4 hours per day for 5 days, when it had met B's car. If B had driven 3 hr a day for 5 days, what was B's speed?

   (a) 8 miles/hr   (b) 9 miles/hr

   (c) 10 miles/hr   (d) 12 miles/hr

5. Sujay alone can finish a project in 10 days while Vijay alone can finish it in 15 days. If they work together and finish the project then, how much amount will Sujay get out of total wages of Rs. 225?

   (a) Rs. 135

   (b) Rs. 112.5

   (c) Rs. 150

   (d) Rs. 90

6. There are 10 points arranged in a line. There are 15 points arranged in parallel below these 10 points. How many possible triangles can be formed?

   (a) 1050   (b) 675

   (c) 1725   (d) 375

7. A man goes uphill at 24 km/hr and comes down at 36 km/hr. What is his average speed?

   (a) 30 km/hr   (b) 35.8 km/hr

   (c) 32.6 km/hr   (d) 28.8 km/hr

8. Find the area of a rhombus one side of which measures 20 cm and one diagonal 24 cm.

   (a) 240 cm^2 (b) 120 cm^2

   (c) 300 cm^2 (d) 384 cm^2

9. If the price of a commodity increases first by 10%, then by 20% and subsequently decreases by 20%, what is the net percentage increase/decrease in the price?

   (a) 10% increase   (b) 20% decrease

   (c) 5.6% decrease   (d) None of these

10. A bag contains one rupee, 50 paise and 25 paise coins in the ratio 5 : 6 : 7. If the total amount is Rs. 390, find the number of 25 paise coins in the bag.

    (a) 140

    (b) 390

    (c) 240

    (d) 280

11. Azhar, Jadeja and Mongia rent a piece of pasture for a month. Azhar puts in 27 cattle for 19 days. Jadeja puts in 21 cattle for 17 days and Mongia puts in 24 cattle for 23 days. If at the end of the month the rent amounts to Rs. 237, how much should Mongia pay?

    (a) Rs. 102

    (b) Rs. 137

    (c) Rs. 92

    (d) Rs. 90

12. AB = AC, DB = DC, $\angle ABC = \frac{1}{2}\angle DBC$ and $\angle D$ = 70°. What is the measure of angle A?
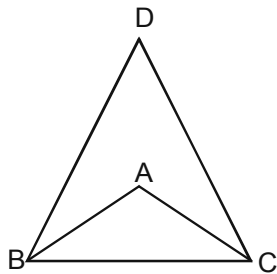
   (a) 125°   (b) 105°
   (c) 70°   (d) 55°

13. If you travel 39 km at a speed of 26 km/hr, another 39 km at a speed of 39 km/hr and next 39 km at a speed of 52 km/hr, what is your average speed for the entire journey?

   (a) 39 km/hr   (b) 37.6 km/hr
   (c) 33.33 km/hr   (d) None of these

14. Two years ago Ram was 6 times as old as his son. After 18 years, he will be twice as old as his son. Find the present ages of Ram and his son.

   (a) 34 years, 9 years
   (b) 36 years, 11 years
   (c) 32 years, 7 years
   (d) 30 years, 10 years

15. The cost of manufacturing a commodity increased by 20%. A trader who did not revise the selling price noted that there was a drop of Rs. 20 in his profit. What is the original cost price?

   (a) Rs. 100   (b) Rs. 200
   (c) Rs. 500   (d) None of these

16. Mangesh writes first hundred whole numbers. How many times does he write zero? Also find out how many times will the number '9' occur in the set of first hundred whole numbers?

   (a) 12, 19   (b) 10, 20
   (c) 11, 19   (d) 12, 20

17. A car is running at a speed of 72 km/hr. How much time will it take to cover a distance of 100 m?

   (a) 5 sec
   (b) 72 sec
   (c) 10 sec
   (d) 5 hr

18. The average weight of 2 men A and B is 84 kg. Another man C joins the group and the average weight decreases by 4 kg. If another man D, whose weight is 3 kg more than that of C, replaces A, then the average weight of B, C and D becomes 79 kg. The weight of A (in kg) is

   (a) 82   (b) 78
   (c) 75   (d) 79

19. A man travels 20 miles at 4 miles per hour and another 60 miles at 6 miles per hour. What is his average speed for the entire trip?

   (a) $12\frac{1}{3}$ miles/h   (b) $8\frac{2}{7}$ miles/h

   (c) $7\frac{3}{11}$ miles/h   (d) $5\frac{1}{3}$ miles/h

20. The incomes of Asha and Brinda are in the ratio 3 : 2 and their expenditures in the ratio 5 : 3. If both of them save Rs.1,500 each, then how much is Brinda's income?

   (a) Rs. 3,000   (b) Rs. 6,000
   (c) Rs. 4,500   (d) Rs. 5,000

21. If $(2^{x+4}) - (2^{x+2}) = 3$, then what is the value of 'x'?

   (a) 0   (b) – 2
   (c) – 1   (d) 2

22. If 18 pumps can raise 2,170 tonnes of water in 10 days working 7 hr a day, in how many days will 16 pumps raise 1,736 tonnes working 9 hr a day?

   (a) 5 days   (b) 6 days
   (c) 8 days   (d) 7 days

23. How many three-digit numbers would you find, which when divided by 3, 4, 5, 6 and 7 leave the remainders 1, 2, 3, 4 and 5 respectively?

   (a) 4   (b) 3
   (c) 1   (d) 2

24. The daily Madhubani - Delhi express starts from Madhubani at 6 a.m. and reaches Delhi at 6 p.m. the next day. The corresponding Delhi - Madhubani express departs from Delhi at 9 p.m. and reaches Madhubani in 36 hr. Both the trains take same route. Find the number of trains from Madhubani to Delhi that a train from Delhi to Madhubani will cross.

   (a) 1
   (b) 2
   (c) 3
   (d) None of these

25. Tangents at A and B of a circle intersect at C. D is any point on the minor arc AB.

    If $\angle ACB = 40°$, then $\angle ADB$ is

    (a) 140° (b) 130°

    (c) 110° (d) 120°

26. A battalion of 4000 men has provisions for 40 days, if after 10 days another 1000 men join, how long will the food last?

    (a) 30 days (b) 20 days

    (c) 22 days (d) 24 days

27. The cost of making an article is divided between materials, labour and overheads in the ratio 3 : 4 : 1. If the materials cost Rs. 22.50, find the cost of the article.

    (a) Rs. 62 (b) Rs. 52.50

    (c) Rs. 70 (d) Rs. 60

28. $$\dfrac{2+\dfrac{1}{3+\dfrac{4}{5}}}{2+\dfrac{1}{3+\dfrac{1}{1+\dfrac{1}{4}}}} = ?$$

    (a) 1 (b) $\dfrac{3}{7}$

    (c) $\dfrac{1}{7}$ (d) $\dfrac{8}{7}$

29. A number N when divided by 5 leaves the remainder 1, and when divided by 6 leaves the remainder 5. The smallest positive N is:

    (a) 14

    (b) 11

    (c) 41

    (d) 22

30. In this figure, the area of the shaded part is
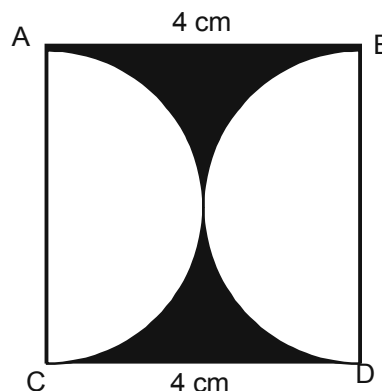
    (a) 3.44 cm²

    (b) 3.2 cm²

    (c) 2.5 cm²

    (d) 4 cm²
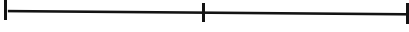
Answer Key

1. (b)	2. (b)	3. (a)	4. (d)	5. (a)	6. (c)	7. (d)	8. (d)	9. (d)	10. (d)
11. (c)	12. (a)	13. (d)	14. (c)	15. (a)	16. (b)	17. (a)	18. (b)	19. (d)	20. (b)
21. (b)	22. (d)	23. (d)	24. (c)	25. (c)	26. (d)	27. (d)	28. (a)	29. (b)	30. (a)

Explanations

1. b   Area of the square field = $\dfrac{1215}{135}$

         = 9 hectare

         = 90,000 sq. m

    Thus, the side of a square = $\sqrt{90,000} = 300\,m$

    Now cost of fencing the same field

    $= 4 \times 300 \times \dfrac{75}{100} = 12 \times 75 = Rs.\,900$.

2. b   We see that the trains take 18 hr and 8 hr respectively to complete its journeys.

    Let the distance between the stations be LCM (18, 8), i.e. 72 km.

    ∴ Speed of the first train = 4 km/hr

    Speed of the second train = 9 km/hr

    By the time the train from A starts, train from B has already travelled 9 km in 1 hr.

    Now the distance between the trains = 72 – 9 = 63 km

    Relative speed of the trains = 9 + 4 = 13 km/hr

    ∴ They will meet $\dfrac{63}{13}$ hr after 11 p.m. i.e. 3.51 a.m.

3. a $AB \cdot d_1 = A$ and $AD \cdot d_2 = A$

    ∴ AB = $\dfrac{A}{d_1}$ and AD = $\dfrac{A}{d_2}$

    The perimeter of the parallelogram

    $= 2(AB + AD) = 2\left(\dfrac{A}{d_1} + \dfrac{A}{d_2}\right) = 2A\left(\dfrac{d_1 + d_2}{d_1 d_2}\right)$

4. d

    20 miles/hr   580 miles   x miles/hr
    4 hrs/day   3 hrs/day
    5 days   5 days

    Distance travelled by A = 20 × 4 × 5 miles = 400 miles.

    So the remaining distance = 580 – 400 = 180 miles has to covered by B in order to meet A.

    ∴ Speed of B = $\dfrac{180}{15} = 12\,miles/hr.$

5. a   Sujay's one day's work = $\dfrac{1}{10}$

    Vijay's one day's work = $\dfrac{1}{15}$

    If they work together they will complete

    $= \dfrac{1}{10} + \dfrac{1}{15} = \dfrac{1}{6}$th work .
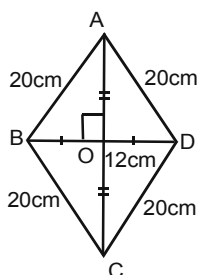
    Thus, to complete whole work they will take 6 days.

    So, Sujay will get an amount = $6 \times \dfrac{1}{10} \times 225$

    $= \dfrac{3}{5} \times 225 = Rs.\,135$

6. c   The number possible triangles that can be formed

    $= {}^{10}C_1 \times {}^{15}C_2 + {}^{10}C_2 \times {}^{15}C_1$

    = 10 × 105 + 45 × 15 = 1725

7. d   Average speed = $\dfrac{2}{\dfrac{1}{24} + \dfrac{1}{36}} = 28.8\,km/hr$

8. d

    In right-angled triangle AOB, we have

    $OB^2 = 400 - 144 = 256$

    ⇒ OB = 16 ∴ BD = 32 cm

    Now area of rhombus = $\dfrac{1}{2} \times d_1 \times d_2 = \dfrac{1}{2} \times 32 \times 24$

    = 16 × 24 = 384 cm^2

9. d   Suppose the initial price is y.

    Final price = y × 1.1 × 1.2 × 0.8 = 1.056y.

    ∴ There is 5.6% increase.

10. d   Let one Rupee, 50 paise and 25 paise coins be 5x, 6x and 7x

    ∴ According to the question, we have

    $5x + \dfrac{1}{2} \times 6x + \dfrac{1}{4} \times 7x = 390$

    ⇒ 20x + 12x + 7x = 1560

    ⇒ 39x = 1560 ⇒ $x = \dfrac{1560}{39} = 40$

    So, the number of 25-paisa coin = 7 × 40 = 280 coins.

11. c   Let Rs. x be the common amount which each of them has to pay.

    Now, according to the question,

    $27 \times \dfrac{19}{30}x + 21 \times \dfrac{17}{30}x + 24 \times \dfrac{23}{30}x = 237$

3x[9 × 19 + 7 × 17 + 8 × 23]

= 237 × 30

$\Rightarrow 474x = 2370 \Rightarrow x = 5$

$\therefore$ Mongia has to pay $24 \times \frac{23}{30} \times 5 = $ Rs. 92

12. a   Since DB = DC

Therefore, triangle is an isosceles triangle.

Thus $\angle DBC = \angle DCB$

As the sum of the angles of the triangle is 180°.

$\therefore 2 \angle DBC + 70° = 180°$

$\Rightarrow \angle DBC = 55°$

Again AB = AC

$\therefore \angle ABC = \angle ACB$

$\Rightarrow \frac{1}{2} \angle DBC = \angle ACB$

$\Rightarrow \angle BAC = 180° - 2\angle ABC = 180° - 55° = 125°$

13. d   Average speed is $\frac{3 \times 26 \times 39 \times 52}{26 \times 39 + 39 \times 52 + 52 \times 26}$.

$= \frac{13^3(3 \times 2 \times 3 \times 4)}{13^2(2 \times 3 + 3 \times 4 + 4 \times 2)} = \frac{13 \times 72}{26} = 36 \text{ km/hr}$

Alternative method:

Assume distance for each different speed = x

Total distance = 3x

Total time = $\frac{x}{26} + \frac{x}{39} + \frac{x}{52} = \frac{169x}{39 \times 52}$

Hence, average speed = $\frac{3x}{\frac{169x}{39 \times 52}} = 36 \text{ km/hr}$.

14. c   Let the age of Ram's son 2 years ago be x years.

Then the age of Ram be 6x (2 years ago).

After 18 years, or from two years ago, i.e 20 years after, son's age will be (x + 20) years

and Ram's age will be 6x + 20 years.

Now according to the question, we have

2(x + 20) = 6x + 20.

$\Rightarrow 2x + 40 = 6x + 20$

$\Rightarrow 4x = 20 \Rightarrow x = 5$

$\therefore$ Their present ages are x + 2 = 5 + 2 =7 years, 6x + 2 = 30 + 2 = 32 years.

15. a   Suppose initial cost price was Rs. x and the selling price is Rs. y.

Initial profit = y – x

After the increase cost price = 1.2x

Now profit = y – 1.2x (Selling price does not change)

Now it is given that (y – x) – (y – 1.2x) = 20

or y – x – y + 1.2x = 20

or 0.2x = 20

or x = Rs. 100

16. b   The first hundred whole numbers begin from 0 to 99.

Thus, number of zero's Mangesh has to write = 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, i.e. 10 times

And number of 9's in the set of hundred whole numbers = 9, 19, 29, 39, 49, 59, 69, 79, 89, 90, 91, ... 99, i.e. 20 times.

17. a $\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{100 \times 3600}{1000 \times 72} = 5 \text{ sec}$

18. b   Given A + B = 84 × 2 = 168 kg

A + B + C = 80 × 3 = 240 kg

Hence C = 240 – 168 = 72 kg

D = 72 + 3 = 75 kg

Given B + C + D = 79 × 3 = 237 kg

Hence, A = (A + B) + C + D – (B + C + D)

= 168 + 147 – 237 = 315 – 237 = 78 kg.

19. d   Average speed = $\frac{20 + 60}{\frac{20}{4} + \frac{60}{6}} = \frac{80}{15} = \frac{16}{3} = 5\frac{1}{3} \text{ miles/hr}$

20. b   Let the incomes of Asha and Brinda be 3x and 2x, and their expenditures be 5y and 3y respectively.

Now, Savings = Incomes – Expenditures.

$\Rightarrow$ 1500 = 3x – 5y   … (i)

and 1500 = 2x – 3y   … (ii)

Multiplying (i) by 2 and (ii) by 3 and subtracting, we get

3000 = 6x – 10y

4500 = 6x – 9y

–1500 = –y

$\Rightarrow$ y = 1500

$\therefore$ 1500 + 7500 = 3x

$\Rightarrow \frac{9000}{3} = x \Rightarrow x = $ Rs. 3,000

Thus, Brinda's income = Rs. 6,000.

21. b   We have

$\left(2^{x+4}\right) - 2^{x+2} = 3$

$\Rightarrow 2^x \cdot 2^4 - 2^x \cdot 2^2 = 3$

$\Rightarrow 16 \cdot 2^2 - 4 \cdot 2^x = 3$

$\Rightarrow 12 \cdot 2^x = 3$

$\Rightarrow 2^x \cdot 3 \cdot 2^x = 3$

$\Rightarrow 3 \cdot 2^{x+2} = 3.2°$

Since the bases are same so comparing the exponents, we have $x + 2 = 0 \Rightarrow x = -2$.

22. d 18 pumps can raise 2,170 tonnes of water in $10 \times 7 = 70$ hr.

In 1 hr 18 pumps can raise $\dfrac{2170}{70} = 31$ tonnes

Let number of days taken by 16 pumps be x.

16 pumps can raise $\dfrac{1736}{9x}$ tonnes

According to the question,

18 days   31 tonnes

16 days $\dfrac{1736}{9x}$

$x = \dfrac{18 \times 1736}{9 \times 16 \times 31} = 7$ days .

23. d LCM (3, 4, 5, 6, 7) = 420

$420 - 2 = 418$, is the number which when divided by 3, 4, 5, 6 and 7 leave the remainder 1, 2, 3, 4 and 5

Also, $418 \times 2 + 2 = 836 + 2 = 838$.

838 is the number which when divided by 3, 4, 5, 6 and 7, leave the remainder 1, 2, 3, 4 and 5.

Thus, there are 2 numbers.

24. c Suppose a train leaves Delhi at 9 p.m. on October 9 (you can take any date): The first train from Madhubani that it will cross will be the train that left Madhubani on October 9. The train from Delhi will reach Madhubani on October 11 at 9 a.m. Therefore, it will cross two more trains from Madhubani, i.e. the trains that left Madhubani on October 10 and 11.

25. c
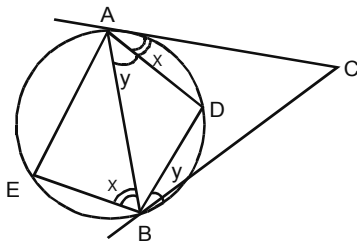
Let $\angle CAD$ be $x°$ and $\angle CBD$ be $y°$.

$\angle CAD = \angle ABD$ (Angle in the alternate segment)

$\angle DBC = \angle BAD$ (Angle in the alternate segment)

$\therefore \angle CAB = \angle CBA = x + y$

$\therefore \angle ACB = 180° - 2(x + y)$

i.e. $40° = 180° - 2(x + y)$

$\therefore (x + y) = 70°$

$\angle ADB = 180° - \angle DAB - \angle DBA$

$= 180° - (x + y)$

$= 180° - 70° = 110°$.

26. d After 10 days, there is provision of food for 30 days

4000 men can consume the food in 30 days

1 men can consume the food in 30×4000

5000 men can consume the food in $\dfrac{30 \times 4000}{5000}$

$= 24$ days

27. d Cost of material = $\dfrac{3}{8}$ of the total cost

$\therefore 22.50 = \dfrac{3}{8}$ of total cost

$\therefore$ Total cost $= 22.5 \times \dfrac{8}{3} = $ Rs. 60

28. a $\dfrac{2 + \dfrac{1}{19}}{2 + \dfrac{1}{3 + \dfrac{4}{5}}} = \dfrac{2 + \dfrac{5}{19}}{2 + \dfrac{5}{19}} = 1$

29. b $N = 5Q + 1$

$N = 6P + 5$ for $P = 1$ the required N is 11

Which also satifies the requirement of first expression.

30. a In the given figure = AC = BD = 4 cm

So, area of shaded part = Area of ABCD – Area of circle of radius 2 cm

$= 4 \times 4 - \pi \times (2)^2$

$= 16 - \pi \times 4 = 16 - 4 \times 3.14$

$= 16 - 12.56 = 3.44$ cm^2