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REASONING & APTITUDE

Duration : 1:00 hr.   **Maximum Marks : 50**

## Read the following instructions carefully

1. This question paper contains **30** objective questions. **Q.1-10** carry one mark each and **Q.11-30** carry two marks each.

2. Answer all the questions.

3. Questions must be answered on Objective Response Sheet (**ORS**) by darkening the appropriate bubble (marked **A**, **B**, **C**, **D**) using HB pencil against the question number. Each question has only one correct answer. In case you wish to change an answer, erase the old answer completely using a good soft eraser.

4. There will be **NEGATIVE** marking. For each wrong answer **1/3rd** of the full marks of the question will be deducted. More than one answer marked against a question will be deemed as an incorrect response and will be negatively marked.

5. Write your name & Roll No. at the specified locations on the right half of the **ORS**.

6. No charts or tables will be provided in the examination hall.

7. Choose the **Closest** numerical answer among the choices given.

8. If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above to that questions.

9. If a question is left blank, i.e., no answer is given by the candidate, there will be **no penalty** for that question.

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Q.1 A part of the sentence given is italicised and underlined. Below are given alternatives to the italicised part which may improve the sentence. Choose the correct alternative. In case no improvement is needed, option (d) is the answer.

It became clear that the strangers were heading *into* a serious disaster.

(a) along
(b) towards
(c) to
(d) No improvement

Q.2 A 4 letter code word consists of letters *A, B,* and *C.* If the code includes all the three letters, how many such codes are possible?

(a) 72
(b) 48
(c) 36
(d) 24

Q.3 If a portion of a half water/half alcohol mix is replaced with 25% alcohol solution, resulting in a 30% alcohol solution, what percentage of the original mix was replaced?

(a) 3%
(b) 20%
(c) 66%
(d) 80%

Q.4 Two positions of a dice are shown. When 4 is at the bottom, what number will be on the top?
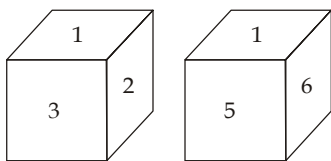
(a) 1
(b) 2
(c) 5
(d) 6

Q.5 A lift has the capacity of 18 men or 24 women or 32 children. What will be the maximum number of children that can board the lift if there are already 6 men and 10 women in the lift?

(a) 4
(b) 6
(c) 8
(d) 10

Q.6 If three sides of a rectangular solid have areas of 12, 18, and 24 unit^2 respectively, what is the volume of the solid in unit^3?

(a) 72
(b) 144
(c) 576
(d) 2,592

Q.7 All who studied commerce enjoy sports. No tax consultant enjoys sports. All those who enjoy sports love classical music.

If the above sentences are true, which of the following must be true?

(a) No one who enjoys classical music is a tax consultant by profession.
(b) Every tax consultant enjoys classical music.
(c) No tax consultant enjoys classical music.
(d) No tax consultant studied commerce.

Q.8 Four persons enter the lift of a seven storey building at the ground floor. In how many ways can they get out of lift on any floor other than the ground floor?

(a) 720
(b) 1296
(c) 1540
(d) 1478

Q.9 A large watermelon weighs 20 kg with 96% of its weight being water. It is allowed to stand in the sun for a while and some of the water evaporates so that now only 95% of it is water. Its reduced weight will be

(a) 16 kg
(b) 19.2 kg
(c) 18 kg
(d) 19.8 kg

Q.10 $2^x = 4^y = 8^z$ and $xyz = 288$, then value of $\dfrac{1}{2x} + \dfrac{1}{4y} + \dfrac{1}{8z}$ is:

(a) $\dfrac{11}{12}$
(b) $\dfrac{11}{96}$
(c) $\dfrac{29}{96}$
(d) None of these

Q.11 What is the sum of all 3 digit numbers that leave a remainder of '2' when divided by 3?

(a) 897
(b) 164,850
(c) 164,749
(d) 149,700

Q.12 In a drawer of shirts, 8 are blue, 6 are green and 4 are magenta. If Sachin draws 2 shirts at random, what is the probability that at least one of the shirts he draws will be blue?

(a) $\dfrac{25}{153}$ (b) $\dfrac{28}{153}$

(c) $\dfrac{5}{17}$ (d) $\dfrac{12}{17}$

Q.13 A dairyman pays ₹ 6.40 per litre of milk. He adds water and sells the mixture at ₹ 8 per litre, thereby making 37.5% profit. The proportion of water to milk received by the customers is

(a) 1 : 10 (b) 1 : 12
(c) 1 : 15 (d) 1 : 20

Q.14 Two semicircles are drawn on adjacent sides of a square with side length 4 units as shown below. What is the area of the shaded region in unit^2? (Sides of square are the diameter of the two semicircles)
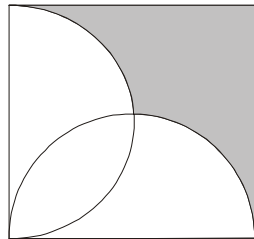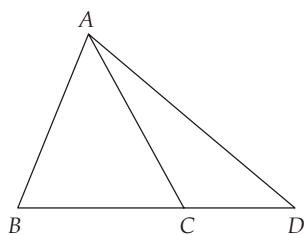

(a) $12 - \pi$ (b) $12 - 2\pi$
(c) $12 + \pi$ (d) $12 + 2\pi$

Q.15 If after 200 grams of water were added to the 24% solution of alcohol, the strength of the solution decreased by one-third, how much of the 24% solution was used?

(a) 180 grams (b) 220 grams
(c) 250 grams (d) 400 grams

Q.16 In the figure below, $AB = AC = CD$. If $ADB = 20°$, what is the value of BAD?

(a) 40° (b) 60°
(c) 70° (d) 120°

Q.17 The difference between the area of the circumscribed circle and the area of the inscribed circle of an equilateral triangle is 2156 sq.cm. What is the area of the equilateral triangle?

(a) $686\sqrt{3}$ sq.cm. (b) 1000 sq.cm.
(c) $961\sqrt{2}$ sq.cm. (d) $650\sqrt{3}$ sq.cm.

Q.18 p and q are positive numbers such that $p^q = q^p$, and $q = 9p$. The value of p is

(a) $\sqrt{9}$ (b) $\sqrt[6]{9}$
(c) $\sqrt[9]{9}$ (d) $\sqrt[8]{9}$

Q.19 A train after traveling for 50 km meets with an accident and then proceeds at 3/4 of its former speed and arrives at its destination 35 minutes late. Had the accident occurred 24 km farther, it would have reached the destination only 25 minutes late. What is the speed of the train in km/hr.

(a) 45 (b) 33
(c) 48 (d) 55

Q.20 An orange vendor makes a profit of 20% by selling orange at a certain price. If he charges ₹1.2 higher per orange he would gain 40%. Find the original price at which he sold an orange.

(a) ₹7.2 (b) ₹6
(c) ₹5 (d) ₹4

Q.21 ΔABC and ΔXYZ are equilateral triangles of 54 cm sides. All smaller triangles like ΔANM, ΔOCP, ΔQPX etc. are also equilateral triangles. Find the area of the shape MNOPQRM.
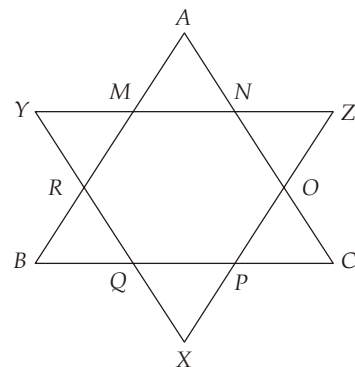
(a) $243\sqrt{3}$ sq.cm. (b) $486\sqrt{3}$ sq.cm.
(c) $729\sqrt{3}$ sq.cm. (d) $4374\sqrt{3}$ sq.cm.

Q.22 What is the sum of the following series?
–64, –66, –68, ..., –100
(a) –1458   (b) –1558
(c) –1568   (d) –1664

Q.23 A book seller sold 240 books on any particular day. He sells one third of the books at the rate of ₹x per book, 78 books at the rate of ₹$(x + a)$ per book and rest of the books at the rate of ₹ $(x – a)$ per book. If the total sale on that day is ₹14384 then what will be the minimum and maximum price of the book ? (If x and a both are positive integers)
(a) ₹66 and ₹74   (b) ₹47 and ₹53
(c) ₹54 and ₹58   (d) ₹56 and ₹64

Q.24 Seven digits from the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 are written in a random order. The probability that this seven digit number will be divisible by 9 is:
(a) $\dfrac{1}{45}$ (b) $\dfrac{5}{63}$
(c) $\dfrac{1}{9}$ (d) $\dfrac{1}{4}$

Q.25 A, B, C and D can finish a task in 10, 12, 15 and 18 days respectively. They can either choose to work or remain absent on a particular day. If 50 percent of the total work gets completed after 3 days, then, which of the following options is possible?
(a) Each of them worked for exactly 2 days.
(b) B and D worked for 1 day each. C worked for 2 days and A worked for all 3 days.
(c) A and C worked for 2 days each, D worked for 1 day and B worked for all 3 days.
(d) A and C worked for 1 day each, B worked for 2 days and D worked for all 3 days.

Q.26 In how many ways a cricketer can make a century with fours and sixes only?
(a) 6   (b) 9
(c) 8   (d) 10

Q.27 x, 17, $3x – y^2 – 2$ and $3x + y^2 – 30$, are four consecutive terms of an increasing arithmetic sequence. The sum of the four numbers is divisible by :
(a) 2   (b) 3
(c) 5   (d) 7

Q.28 The Maximum Retail Price (MRP) of a product is 55% above its manufacturing cost. The product is sold through a retailer, who earns 23% profit on his purchase price. What is the profit percentage (expressed in nearest integer) for the manufacturer who sells his product to the retailer? The retailer gives 10% discount on MRP.
(a) 31%   (b) 22%
(c) 15%   (d) 13%

Q.29 In the coordinate system, the center of a circle lies at (2, 3). If point A with coordinates (–1, 7) does not lie outside the circle, which of the following points must lie inside the circle?
(i) (0, 7)   (ii) (5, –1)
(iii) (–2, 7)
(a) (i) only   (b) (ii) only
(c) (iii) only   (d) (i) and (ii) only

Q.30 Preeti is playing a carnival game in which she is given 4 chances to throw a ball through a hoop. If her chance of success on each throw is 1/5, what is the chance that she will succeed on at least 3 of the throws?
(a) $\dfrac{1}{5^4}$ (b) $\dfrac{1}{5^3}$
(c) $\dfrac{6}{5^5}$ (d) $\dfrac{17}{5^4}$

■■■■

REASONING & APTITUDE

Date of Test : 08/04/2024

ANSWER KEY ➤

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

DETAILED EXPLANATIONS

2.   (c)

As code must include all the three letters then pattern of the code word is *ABCX* where *X* can be any letter out of *A, B,* and *C*. So we can have the code word consisting of letters:

ABCA;

ABCB;

ABCC.

We can arrange letters in each of above 3 cases in $\dfrac{4!}{2!}$ number of ways (as each case has 4 letters

out of which one is repeated twice), so total number of code words is $3 \times \dfrac{4!}{2!} = 36$.

3.   (d)

Initial solution is "half water/half alcohol mix" means it's 50% (0.5) alcohol solution.

Let the portion replaced be *x* and the volume of initial solution be 1 unit.

Then the amount of alcohol after removal of a portion will be 0.5 (1 – *x*) and the amount of alcohol added will be **0.25*x***, so total amount of alcohol will be (1 – *x*) + 0.25x. On the other hand as in the end 30% alcohol solution was obtained then the amount of alcohol in the end was 0.3 × 1.

So 0.5 (1 – *x*) + 0.25*x* = 0.3 $\Rightarrow$ *x* = 0.8, or 80%.

4.   (a)

From figures, we conclude that 2, 3, 5 and 6 are adjacent to 1. Therefore, 4 lies opposite 1. Hence, when 4 is at the bottom, then 1 must be on the top.

5.   (c)

Let the number of children in the lift is *x*

Now, $\dfrac{6}{18} + \dfrac{10}{24} + \dfrac{x}{32} = 1$

$\dfrac{x}{32} = 1 - \dfrac{1}{3} - \dfrac{5}{12}$

Maximum number of children that can board the lift *x* = $\dfrac{32}{4} = 8$ children
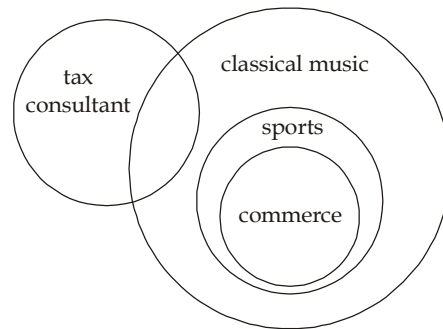
6.   (a)

$$lb = 12$$
$$bh = 18$$
$$lh = 24$$

Multiplying the three equations,

$$(lbh)^2 = 12 \times 18 \times 24$$
$$= 2 \times 2 \times 3 \times 2 \times 3 \times 3 \times 2 \times 2 \times 2 \times 3$$
$$= (2)^6 \times (3)^4$$
$$lbh = (2)^3 \times (3)^2$$
$$= 8 \times 9 = \mathbf{72}$$

7. **(d)**

From the Venn diagram, we can see that only option (d) is possible.

8. **(b)**

Each person out of 4 has 6 floors (options) to get out of (since no one gets out on the ground floor), hence total ways is $6 \times 6 \times 6 \times 6 = 6^4 = 1296$.

9. **(a)**

Since 96% of the 20 kg watermelon is water, 4% of the 20 kg is non–water : $(0.04) (20) = 0.8$ kg

Since 95% of the post–evaporation watermelon is water, the remaining 5% must be composed of the 0.8 kg of non–water : $0.05x = 0.8$

$$\Rightarrow \qquad x = \frac{0.8}{0.05} = \frac{80}{5} = 16 \, \text{kg}$$

10. **(b)**

$$2^x = 4^y = 8^z \Rightarrow 2^x = 2^{2y} = 2^{3z}$$

$$\Rightarrow \qquad x = 2y = 3z = k \text{ (say)}$$

Then $\qquad xyz = \dfrac{k^3}{6} = 288 \Rightarrow k = 12$

$$\therefore \qquad x = 12, \, y = 6, \, z = 4$$

$$\Rightarrow \qquad \frac{1}{2x} + \frac{1}{4y} + \frac{1}{8z} = \frac{11}{96}$$

11. **(b)**

The series will be of the form : 101, 104, 107.....995, 998.

It will have a total of 300 terms (999 – 100 + 1 = 900. Take $\dfrac{1}{3}$ of this, since only 1 term is there in every 3)

Now, $\qquad$ Sum $= \dfrac{(1^{st} \text{ number} + n^{th} \text{ number}) \times n}{2}$

$$= \frac{(101 + 998) \times 300}{2}$$

$$= \frac{1099 \times 300}{2}$$

$$= 164{,}850$$

12. **(d)**

There are a total of 18 shirts : 8 blue and 10 non blue.

P (selecting at least 1 blue shirt) = 1 – P (selecting no blue shirts)

Assuming no replacement

P (selecting first non-blue shirt) = $\dfrac{10}{18}$

P (selecting second non-blue shirt) = $\dfrac{9}{17}$

P (selecting no blue shirts) = $\dfrac{10}{18} \times \dfrac{9}{17} = \dfrac{10}{34}$

$\therefore$ P (selecting at least 1 blue shirt) = $1 - \left(\dfrac{10}{34}\right) = \dfrac{24}{34} = \dfrac{12}{17}$

13. **(a)**

$$\begin{aligned} \text{Milk} &= m \text{ litres;}\\ \text{Water} &= w \text{ litres;}\\ \text{Cost of } (m + w) \text{ litres} &= 6.4\, m;\\ \text{Selling price of } (m + w) \text{ litres} &= 8\,(m + w). \end{aligned}$$

Given that 6.4 m × 1.375 = 8 ($m + w$) $\Rightarrow \dfrac{w}{m} = \dfrac{1}{10}$.

14. **(b)**

Since the two semi circles are congruent, they intersect at the top of the arc.

We can divide this into 3 regions

I.   A quarter circle with radius 2 (Area = $\dfrac{\pi \times 2 \times 2}{4} = \pi$)

II. A square with side 2 (Area = 2 × 2 = 4)

III. Another quarter circle with radius 2 (Area = $\dfrac{x \times 2 \times 2}{4} = \pi$)

$$\begin{aligned} \text{Total} &= 4 \times 4 = 16\\ \text{Shaded Area} &= \text{Total Area} - \text{I} - \text{II} - \text{III}\\ \therefore \quad \text{Shaded Area} &= 16 - \pi - 4 - \pi = 12 - 2\pi \end{aligned}$$

15. **(d)**

Let the weight of 24% solution used be x grams, weight of alcohol in it would be 0.24x.

As in final solution strength decreased by $\dfrac{1}{3}$ thus it became $24 \times \dfrac{2}{3} = 16\%$.

Set the equation : 0.24x = 0.16 (x + 200), the weight of 16% alcohol in (x + 200) grams of new solution comes only from (equal to) 24% alcohol in x grams of strong (initial) solution, as there is 0 grams of alcohol in water (0% alcohol solution)

$\Rightarrow$ 0.08x = 32

$\Rightarrow$ x = 400

16. **(d)**
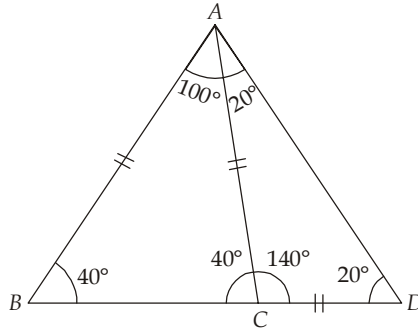
$$AB = AC = CD \Rightarrow \angle CAD = \angle CDA = 20°$$

and $\angle ABC = \angle ACB$

In ΔACD

$$\Rightarrow \angle ACD + \angle CAD + \angle CDA = 180°$$
$$\Rightarrow \angle ACD = 180° - 20° - 20° = 140°$$
$$\Rightarrow \angle ACB = 180° - 140° = 40° = \angle ABC$$

Similarly in ΔABC

$$\Rightarrow \angle BAC = 180° - 40° - 40° = 100°$$
$$\therefore \angle BAD = 100° + 20° = 120°$$

17. **(a)**

Let radius of in circle $= r \Rightarrow$ Radius of circumcircle $= 2r$

Difference in area $= \pi[(2r)^2 - (r)^2] = 2156$

$$\Rightarrow 3 \times \frac{22}{7} \times r^2 = 2156$$

$$\Rightarrow r^2 = \frac{2156 \times 7}{66}$$

$$\Rightarrow r = \sqrt{\frac{686}{3}}$$

Now, height of equilateral triangle $= 3r = \frac{\sqrt{3}}{2}a$ (where a is side of triangle)

$$\Rightarrow 3 \times \sqrt{\frac{686}{3}} = \frac{\sqrt{3}}{2}a$$

$$\Rightarrow a = 2\sqrt{686}$$

$$\therefore \text{Area of triangle} = \frac{\sqrt{3}}{4}a^2$$

$$= \frac{\sqrt{3}}{4} \times 4 \times 686 = 686\sqrt{3} \text{ cm}^2$$

18. **(d)**

$$p^q = q^p$$

It has been given that $q = 9p$.

Substituting, we get,

$$p^{9p} = (9p)^p$$
$$(p^p)^9 = 9^p \times p^p$$
$$\Rightarrow (p^p)^8 = 9^p$$
$$p^{8p} = 9^p$$

Raising the power to $\dfrac{1}{p}$ on the both sides, we get,

$$p^8 = 9$$
$$p = \sqrt[8]{9}$$

19. **(c)**

Let d = Total distance

divide each case into 3 segments:

1. first 50 km
2. next 24 km
3. last $d - 74$ km

let s = Speed of train

for segment 1, in each case, time = $\dfrac{50}{s}$

for segment 3, in each case, time = $\dfrac{d-74}{\left(\dfrac{3s}{4}\right)}$

Therefore, segment 2 must account for the 10 minute total time difference between the two cases

$$\dfrac{24}{\left(\dfrac{3s}{4}\right)} - \dfrac{24}{s} = \dfrac{1}{6}$$

$$\Rightarrow s = 48 \text{ km/hr}$$

20. **(a)**

Let cost price be c and selling price be s

$$s = 1.2c$$
$$\Rightarrow s + 1.2 = 1.4c$$
$$\Rightarrow 1.2c + 1.2 = 1.4c$$
$$\Rightarrow c = 6$$
$$\Rightarrow s = 7.2$$

21. **(b)**

AB = 54 cm and ΔANM, ΔOCP, ΔOPX are equilateral triangles.

$$\Rightarrow MN = MR = NO = OP = PQ = QR = \dfrac{54}{3} = 18 \text{ cm}$$

Thus, MNOPQRM is regular hexagon with side 18 cm

$$\therefore \quad \text{Area of MNOPQRM} = \dfrac{3\sqrt{3}}{2}(\text{side})^2$$

$$\frac{3\sqrt{3}}{2}(18)^2 \;=\; 486\sqrt{3} \text{ sq.cm.}$$

22. (b)

The series is an *A.P.* with common difference, $d = -66 - (-64) = -2$

First term, $a = -64$ and last terms $a_n = -100$

n^{th} term of the series, $a_n = a + (n-1)d$

$\Rightarrow \qquad\qquad\qquad -100 = -64 + (n-1)(-2)$

$\Rightarrow \qquad\qquad\qquad n-1 = \dfrac{-36}{-2} = 18$

$\Rightarrow \qquad\qquad\qquad n = 18 + 1 = 19$

$\therefore \qquad\qquad \text{Sum} = \dfrac{n}{2}(a + a_n)$

$$= \dfrac{19}{2} \times (-64 - 100) = \dfrac{19}{2} \times (-164)$$

$$= 19 \times (-82) = -1558$$

23. (d)

$$\text{Total books} = 240$$

I.   80 books at the rate of ₹x per book

II. 78 books at the rate of ₹$(x + a)$ per book

III. $[240 - (78 + 80)] = 82$ books at the rate of ₹$(x - a)$ per book.

$$\text{Total sale} = ₹14384$$

Now, $80 \times x + 78(x + a) + 82(x - a) = 14384$

$$240x - 4a = 14384$$

$$60x - a = 3596 \qquad\qquad\qquad\qquad\qquad ....(1)$$

This equation has two variables and only one equation. So it can be solved by putting option value.

Putting, $\qquad\qquad\qquad x = 60$

$$60 \times 60 - a = 3596$$

$$a = 4$$

Hence,

Maximum price of book $= 60 + 4 = ₹64/\text{book}$

Minimum price of book $= 60 - 4 = ₹56/\text{book}$

Note : Reason behind putting $x = 60$ is that in any option a value is not more that 4. According to that nearest integer value of x should be 60.

24. (c)

An integer is divisible by 9 if the sum of its digits is divisible by 9.

Since the sum of first 9 natural number is $\dfrac{9(9+1)}{2} = 45$, which is divisible by 9, it must be the case

that the sum of the two integers that we don't pick to form the seven digit number is divisible by 9.

Number of ways of choosing two integers from 9 integers : $^9C_2 = 36$

Number of two digit pairs whose sum is divisible by 9 : {(1, 8), (2, 7), (3, 6), (4, 5)} = 4

Simply take the ratio to get the probability that the seven digit number so formed is

divisible by 9 : $\dfrac{4}{36} = \dfrac{1}{9}$

25. **(d)**

Let us assume the amount of work to be finished = LCM of {10, 12, 15, 18} = 180 units.

The amount of work which A can complete in a day = $\dfrac{180}{10}$ = 18 units.

The amount of work which B can complete in a day = $\dfrac{180}{12}$ = 15 units.

The amount of work which C can complete in a day = $\dfrac{180}{15}$ = 12 units.

The amount of work which D can complete in a day = $\dfrac{180}{18}$ = 10 units.

It is given that 50 percent of the total work gets completed after 3 days. Therefore, we can say that 90 units of work was completed in 3 days.

Let us check options.

Option (a) : Each of them worked for exactly 2 days.

In this case amount of work completed = 2 × (10 + 15 + 12 + 18) = 110 units.

Option (b) : B and D worked for 1 day each, C worked for 2 days and A worked for all 3 days. In this case amount of work completed = 1 × (10 + 15) + 2 × (12) + 3 × (18) = 103 units.

Option (c) : A and C worked for 2 days each, D worked for 1 day and B worked for all 3 days. In this case amount of work completed = 2 × (18 + 12) + 1 × (10) + 3 × (15) = 115 units.

Option (d) : A and C worked for 1 day each, B worked for 2 days and D worked for all 3 days. In this case amount of work completed = 1 × (18 + 12) + 2 × (15) + 3 × (10) = 90 units.

Therefore, we can say that option (d) is the correct answer.

26. **(b)**

The possible ways are

i. (25 × 4)

ii. (22 × 4 + 2 × 6)

iii. (19 × 4 + 4 × 6)

iv. (16 × 4 + 6 × 6)

v. (13 × 4 + 8 × 6)

vi. (10 × 4 + 10 × 6)

vii. (7 × 4 + 12 × 6)

viii. (4 × 4 + 14 × 6)

ix. (1 × 4 + 16 × 6)

Hence there are total 9 ways.

27. **(a)**

The terms x, 17, $3x - y^2 - 2$ and $3x + y^2 - 30$ are in A.P.

Common difference : $d = 17 - x$ .....(i)

$$d = 3x - y^2 - 19$$ .....(ii)

$$d = 2y^2 - 28$$ .....(iii)

From equation (i) & (ii),

$$17 - x = 3x - y^2 - 19$$

$\Rightarrow$ $4x - y^2 = 36$ .....(iv)

From equation (ii) & (iii),

$$3x - y^2 - 19 = 2y^2 - 28$$

$\Rightarrow$ $x - y^2 = -3$ .....(v)

Solving equation (iv) & (v), we get :

$$x = 13, y^2 = 16$$

$\Rightarrow$ Terms are $= 13, 17, 21, 25$

$\therefore$ Sum $= 13 + 17 + 21 + 25 = 76$

Which is divisible by 2. (among the given options)

28. **(d)**

Let Manufacturing Cost of the product = ₹100

$\Rightarrow$ Maximum Retail Price (MRP) $= 100 + \dfrac{55}{100} \times 100 = ₹\, 155$

Retailer gives 10% discount on MRP

$\Rightarrow$ Retailer's selling price $= 155 - \dfrac{10}{100} \times 155 = ₹\, 139.5$

It is given that the Retailer earned 23% profit on his purchase price, say ₹x

$\Rightarrow$ $\dfrac{123x}{100} = 139.5$

$\Rightarrow$ $x = \dfrac{13950}{123} = 113.41$

Now, the purchase price of Retailer $= x =$ selling price of Manufacturer

$\therefore$ Profit earned by Manufacturer $= 113.41 - 100 = ₹13.41 \approx 13\%$

29. **(a)**

Point $A(-1, 7)$ does not lie outside the circle. So, point can lie on the circle or inside the circle. Distance of A from center = 5 units. So, for the points to lie inside the circle, the distance of given points from center has to be less than 5 units.

Point (i) – Distance between (0, 7) and (2, 3) = $\sqrt{20}$, which is less than 5

Point (ii) – Distance between (5, –1) and (2, 3) = 5

Point (iii) – Distance between (–2, 7) and (2, 3) = $4\sqrt{2}$, which is more than 5

So, option (a).

30. **(d)**

At least 3 out of 4 throws means 3 or 4 throws

So, $P = {}^4C_3 \times \left(\dfrac{1}{5}\right)^3 \times \dfrac{4}{5} + \left(\dfrac{1}{5}\right)^4 = \dfrac{17}{5^4}.$

■■■■