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## Odisha Police SI Previous Year Question

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### 20 TOUGHEST PYQ

Hand-picked from Odisha Police SI (OPRB) papers – 2016 Pre & Mains, 2017, 2019, 2022 and 2023 – Maths, Reasoning & GK, with the same step-by-step solutions you get in the full pack.

**Q-1 In a certain school, 20% of students are below 8 years of age.**

**The number of students above 8 years of age is  $\frac{2}{3}$  of the number of students of 8 years of age which is 48. What is the total number of students in the school?**

**[Odisha Police SI Pre 2016]**

- (A) 72
- (B) 80
- (C) 120
- (D) 100

**ANS-** (D) 100

**Given:**

- Students of age 8 years = 48
- Students above 8 years =  $\frac{2}{3}$  of those of 8 years
- Students below 8 years = 20% of the total

**Concept:**

- Total = (below 8) + (8 years) + (above 8)
- Below 8 is 20%, so the other two groups together are  $100\% - 20\% = 80\%$  of the total

**Solution:**

- Above 8 years =  $\frac{2}{3} \times 48 = 32$
- 8 years + above 8 =  $48 + 32 = 80$
- 80% of the total = 80
- ⇒ Total =  $\frac{80 \times 100}{80} = 100$

∴ Ans: (D) 100

**Q-2 Match each of the following facts relating to Buddha in Column A with the associated places in Column B and select the correct answer set from the table given below:**

**[Odisha Police SI Mains 2016]**

| Column A         | Column B        |
|------------------|-----------------|
| (a) Birthplace   | (i) Bodh Gaya   |
| (b) First Sermon | (ii) Kushinagar |



|                     |                |
|---------------------|----------------|
| (c) Nirvana         | (iii) Lumbini  |
| (d) Mahaparinirvana | (iv) Rajagriha |
|                     | (v) Sarnath    |

- (A) (a)-iii, (b)-v, (c)-i, (d)-ii  
(B) (a)-iv, (b)-v, (c)-i, (d)-ii  
(C) (a)-ii, (b)-iv, (c)-v, (d)-iii  
(D) (a)-ii, (b)-i, (c)-iv, (d)-iii

**ANS-** (A) (a)-iii, (b)-v, (c)-i, (d)-ii

**Explanation:** Each event of Buddha's life is linked to one place: birth at **Lumbini**, first sermon at **Sarnath**, enlightenment (**nirvana**) at **Bodh Gaya**, and death (**Mahaparinirvana**) at **Kushinagar**. This gives the order (a)-iii, (b)-v, (c)-i, (d)-ii. The first sermon at Sarnath is called **Dhammachakkapavattana** (turning the wheel of dharma).

| Event                  | Place      | Detail                  |
|------------------------|------------|-------------------------|
| <b>Birth</b>           | Lumbini    | Ashokan pillar, 249 BCE |
| <b>Nirvana</b>         | Bodh Gaya  | Under the Bodhi tree    |
| <b>First Sermon</b>    | Sarnath    | Near Varanasi           |
| <b>Mahaparinirvana</b> | Kushinagar | At the age of 80        |

**Key Points:**

- ✦ **Lumbini:** now in Nepal, a UNESCO site since 1997
- ✦ **Real name:** Siddhartha Gautama, of the Shakya clan
- ✦ **Four holy sites:** Lumbini, Bodh Gaya, Sarnath and Kushinagar

**Other Options:**

(B) (a)-iv, (b)-v, (c)-i, (d)-ii — Rajagriha (Rajgir) was the capital of **Bimbisara** and the site of the first Buddhist council; Buddha was born at Lumbini.

(C) (a)-ii, (b)-iv, (c)-v, (d)-iii — Kushinagar is the place of Buddha's death (Mahaparinirvana), and Rajagriha is the old Magadha capital of **Bimbisara**.

(D) (a)-ii, (b)-i, (c)-iv, (d)-iii — Bodh Gaya is the place of enlightenment under the Bodhi tree, where the **Mahabodhi Temple** now stands in Bihar.

**Q-3** In an open field, Alok started from a point A and moved to east by 25 metres and then turned right by 45 metres to reach point B. Then he moved to east for 35 metres from where he turned left by 65 metres to reach point C. Then he moved to west by 50 metres from where he turned left for 10 metres to reach the destination D. In which direction of his destination is his starting point?





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**[Odisha Police SI Mains 2016]**

- (A) North-east
- (B) South
- (C) South-west
- (D) West

**ANS-** (C) South-west

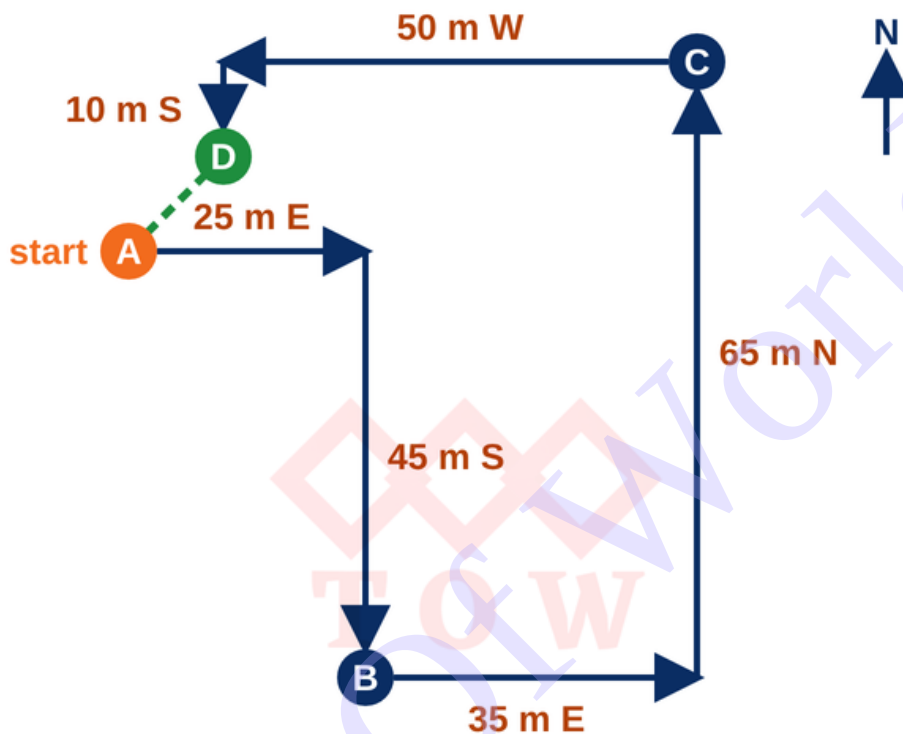
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**STEP 1** Draw the walk (North is up)



Alok walks  $A \rightarrow B \rightarrow C \rightarrow D$ . Each turn is from the way he is facing.



**STEP 2** Where is A from D?

D is 10 m East and 10 m North of A  
So A is 10 m **West** and 10 m **South** of D

**HINT:** Facing East: right turn = South, left turn = North.  
Facing West: left turn = South.

**FINAL ANSWER: South-west**

**Q-4** A can contains a mixture of two liquids A and B in the proportion of 7 : 5. If 9 litres of the mixture is replaced by 9 litres of the liquid B, then the ratio between liquid A and liquid B becomes 7 : 9. How much of the liquid A was there in the can initially?



**[Odisha Police SI Mains 2016]**

- (A) 14 litres  
(B) 21 litres  
(C) 28 litres  
(D) 35 litres

**ANS-** (B) 21 litres

**Given:**

→ Mixture A : B = 7 : 5, total = x litres

→ 9 L of the mixture is replaced by 9 L of B, new ratio A : B = 7 : 9

**Start: 7 : 5** **36 L**

|              |               |
|--------------|---------------|
| <b>A = ?</b> | <b>B = 15</b> |
|--------------|---------------|

**Take out 9 L** **27 L**

|                  |                  |
|------------------|------------------|
| <b>A = 15.75</b> | <b>B = 11.25</b> |
|------------------|------------------|

**Add 9 L of B** **36 L**

|                  |                  |
|------------------|------------------|
| <b>A = 15.75</b> | <b>B = 20.25</b> |
|------------------|------------------|

**Concept:**

→ Removing mixture removes A and B in the same ratio 7 : 5

→ Only B is added back, so the total stays x and A is the part that changes

**Solution:**

→ A is now 7 parts out of 16, so  $A = \frac{7}{16} \times x$

→ A left after removal =  $\frac{7}{12} \times (x - 9)$

$$\Rightarrow \frac{7}{12} (x - 9) = \frac{7}{16} x$$

$$\Rightarrow 16(x - 9) = 12x, \text{ so } x = 36$$

→ Initial A =  $\frac{7}{12} \times 36 = 21$  litres

∴ Ans: (B) 21 litres

**Hint:**

→ Check: A left =  $\frac{7}{12} \times 27 = 15.75$  and  $B = 11.25 + 9 = 20.25$ , so 15.75 : 20.25 = 7 : 9

**Q-5** In a circle O is the centre and A, C and B are three points, located clockwise, on the perimeter of the circle. If  $\angle AOC$  and  $\angle BOC$  are  $120^\circ$  and  $100^\circ$  respectively, then how much is  $\angle ACB$ ?

**[Odisha Police SI Mains 2016]**

- (A)  $45^\circ$   
(B)  $60^\circ$

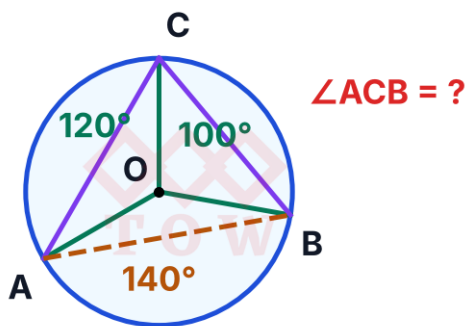


- (C)  $70^\circ$   
(D)  $75^\circ$

**ANS-** (C)  $70^\circ$

**Given:**

- O = centre,  $\angle AOC = 120^\circ$ ,  $\angle BOC = 100^\circ$   
→ A, C, B lie clockwise on the circle



**Concept:**

- Angles around the centre add up to  $360^\circ$   
→ Angle made by an arc at the centre =  $2 \times$  angle it makes at any point on the remaining part of the circle

**Solution:**

- $\angle AOB = 360^\circ - (120^\circ + 100^\circ) = 140^\circ$   
→ C is not on this  $140^\circ$  arc AB, so  $\angle ACB$  stands on it  
→  $\angle ACB = \frac{1}{2} \times \angle AOB = \frac{1}{2} \times 140^\circ = 70^\circ$

∴ Ans: (C)  $70^\circ$

**Q-6** If 24 men or 32 women can do a work in 172 days, how long will 42 men and 30 women take to do the same work?

[Odisha Police SI 2017]

- (A) 60  
(B) 64  
(C) 75  
(D) 86

**ANS-** (B) 64

**Given:**

- 24 men = 32 women (same work, same 172 days)  
→ Required: days for 42 men + 30 women

**Concept:**

- Same work in the same time means equal daily work: 24 men = 32 women  
→ Man : woman =  $32 : 24 = 4 : 3$  in daily work  
→ Total work = daily work  $\times$  days



**Solution:**

- Take 1 woman = 3 units/day, so 1 man = 4 units/day
- Total work =  $32 \times 3 \times 172 = 16512$  units
- Daily work of 42 men + 30 women =  $42 \times 4 + 30 \times 3 = 258$  units
- Days =  $\frac{16512}{258} = 64$

∴ Ans: (B) 64

**Hint:**

- Alternative: 42 men = 56 women, so 42 men + 30 women = 86 women
- ⇒  $32 \times 172 = 86 \times d$ , so  $d = \frac{32 \times 172}{86} = 64$

**Q-7 Two trains A and B leave Howrah for Chennai at 8:00 pm and 8:30 pm respectively and run nonstop at speeds of  $90 \text{ km/hr}$  and  $120 \text{ km/hr}$  respectively. At what distance from Howrah, will the two trains meet?**

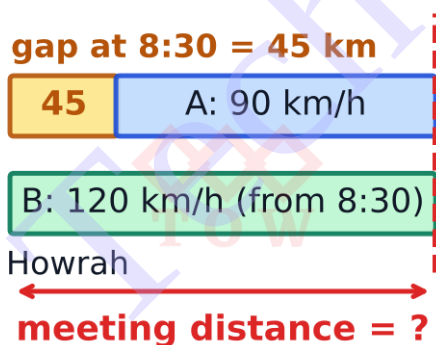
**[Odisha Police SI 2017]**

- (A) 120 km
- (B) 180 km
- (C) 240 km
- (D) 360 km

**ANS-** (B) 180 km

**Given:**

- Train A: leaves 8:00 pm, speed  $90 \text{ km/hr}$
- Train B: leaves 8:30 pm, speed  $120 \text{ km/hr}$ , same route



**Concept:**

- Distance = speed  $\times$  time
- Same direction: gap closes at relative speed =  $120 - 90$
- Catch-up time =  $\frac{\text{Gap}}{\text{Relative speed}}$

**Solution:**

- A runs alone for 30 min =  $\frac{1}{2} \text{ h}$





$$\Rightarrow \text{Gap at 8:30 pm} = 90 \times \frac{1}{2} = 45 \text{ km}$$

$$\rightarrow \text{Relative speed} = 120 - 90 = 30 \text{ km/hr}$$

$$\rightarrow \text{Time to meet after 8:30 pm} = \frac{45}{30} = 1.5 \text{ h}$$

$$\rightarrow \text{Distance from Howrah} = \text{B's distance} = 120 \times 1.5 = 180 \text{ km}$$

$\therefore$  Ans: (B) 180 km

**Hint:**

$\rightarrow$  Check with A: time run =  $0.5 + 1.5 = 2 \text{ h}$ , so  $90 \times 2 = 180 \text{ km}$ , the same point

**Q-8** In a class five students - P, Q, R, S and T are sitting in a row facing to the south in the following formation. Which two are at the extreme ends?

**Formation:** R is immediate right of T and S is immediate left of P, while Q is in between P and T.

**[Odisha Police SI 2017]**

- (A) Q and P
- (B) Q and T
- (C) R and S
- (D) S and T

**ANS-** (C) R and S



All 5 face SOUTH, i.e. they face you.

Their RIGHT is on your LEFT.



END



END

**STEP 1** R is immediate right of T, so R sits on T's right (your left): R T.

**STEP 2** S is immediate left of P, so S sits on P's left (your right): P S.

**STEP 3** Q is between P and T: R T Q P S. The two ends are R and S.

**HINT:** Facing south (towards you), left and right swap on paper.

**FINAL ANSWER: R and S**

**Q-9** Four bells begin tolling at the same time and continue to toll at intervals of 20, 25, 28  $\wedge$  50 seconds respectively. Find the smallest integral number of minutes after which all the bells toll together again.

[Odisha Police SI 2019]

- (A) 700
- (B) 70
- (C) 1400
- (D) 35

**ANS-** (D) 35

**Given:**

- Four bells toll at intervals of 20, 25, 28 and 50 seconds
- Required: smallest whole number of minutes after which all toll together



$$20 \text{ s} = 2^2 \times 5$$

$$25 \text{ s} = 5^2$$

$$28 \text{ s} = 2^2 \times 7$$

$$50 \text{ s} = 2 \times 5^2$$

$$\text{LCM} = 2^2 \times 5^2 \times 7 = 700 \text{ s}$$

$$700 \text{ s} = 11\frac{2}{3} \text{ min (not whole)}$$

$$\text{LCM}(700, 60) = 2100 \text{ s}$$

**Minutes = ?**

**Concept:**

→ Bells toll together again after the LCM of their intervals  
→ The time must be a whole number of minutes, so it must also be a multiple of 60 seconds

**Solution:**

$$\rightarrow 20 = 2^2 \times 5, 25 = 5^2, 28 = 2^2 \times 7, 50 = 2 \times 5^2$$

$$\Rightarrow \text{LCM} = 2^2 \times 5^2 \times 7 = 700 \text{ seconds}$$

$$\rightarrow 700 \text{ seconds} = 11\frac{2}{3} \text{ minutes, not a whole number}$$

→ Need a common multiple of 700 and 60

$$\Rightarrow \text{LCM}(700, 60) = 2100 \text{ seconds}$$

$$\Rightarrow \frac{2100}{60} = 35 \text{ minutes}$$

∴ Ans: (D) 35

**Hint:**

→ Alternative:  $700 \text{ seconds} = \frac{700}{60} = \frac{35}{3} \text{ minutes}$ , so multiply by 3 to get the first whole number: 35 minutes

**Q-10 A toy plane flies along the four sides of a square at speeds of 100, 200, 300, 400 km/hr on each side respectively. Find its average speed.**

**[Odisha Police SI 2019]**

(A) 250 km/hr

(B) 190 km/hr

(C) 192 km/hr

(D) 200 km/hr

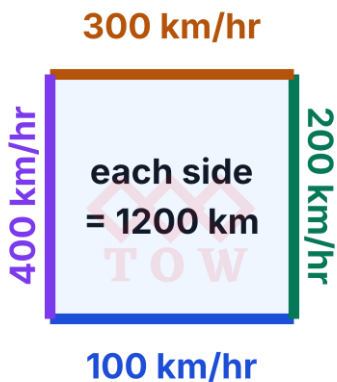
**ANS-** (C) 192 km/hr

**Given:**

→ Four equal sides, speeds 100, 200, 300, 400 km/hr

→ Distance on each side is the same





**Average speed = ?**

**Concept:**

→ Average speed =  $\frac{\text{Total distance}}{\text{Total time}}$  (not the mean of the speeds)

→ Time =  $\frac{\text{Distance}}{\text{Speed}}$

**Solution:**

→ Take each side = LCM(100, 200, 300, 400) = 1200 km

→ Total distance =  $4 \times 1200 = 4800$  km

→ Times:  $\frac{1200}{100} = 12$  h,  $\frac{1200}{200} = 6$  h,  $\frac{1200}{300} = 4$  h,  $\frac{1200}{400} = 3$  h

⇒ Total time =  $12 + 6 + 4 + 3 = 25$  h

→ Average speed =  $\frac{4800}{25} = 192$  km/hr

∴ Ans: (C) 192 km/hr

**Hint:**

→ Alternative: for equal distances, average speed =  $\frac{4}{\frac{1}{100} + \frac{1}{200} + \frac{1}{300} + \frac{1}{400}} = 192$  km/hr

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**Q-11 If the difference between simple interest and compound interest on a certain sum for 2 years at 10% is Rs. 50, then find the sum.**

**[Odisha Police SI 2019]**

- (A) Rs. 5050
- (B) Rs. 4700
- (C) Rs. 5000
- (D) Rs. 3750

**ANS-** (C) Rs. 5000



**Given:**

→ Time  $n = 2$  years, rate  $r = 10\%$

→  $CI - SI = \text{Rs. } 50$ , sum  $P = ?$

**Take  $P = 100$  units**

Yr 1 

|           |    |
|-----------|----|
| $P = 100$ | 10 |
|-----------|----|

Yr 2 

|           |    |         |
|-----------|----|---------|
| $P = 100$ | 10 | 1 extra |
|-----------|----|---------|

**1 unit = Rs. 50,  $P = ?$**

**Concept:**

→ For 2 years,  $CI - SI = \text{interest on the first year's interest} = P \times \left(\frac{r}{100}\right)^2$

**Solution:**

$$\rightarrow 50 = P \times \left(\frac{10}{100}\right)^2$$

$$\Rightarrow 50 = \frac{P}{100}$$

$$\rightarrow P = 50 \times 100 = \text{Rs. } 5000$$

∴ Ans: (C) Rs. 5000

**Hint:**

→ Alternative (as in the picture): take  $P = 100$  units;  $SI = 10 + 10 = 20$  and  $CI = 10 + 11 = 21$ , so the extra 1 unit = Rs. 50 and  $P = 100 \times 50 = \text{Rs. } 5000$

→ Check:  $SI = \frac{5000 \times 10 \times 2}{100} = 1000$  and  $CI = 5000 \times \left(\frac{11}{10}\right)^2 - 5000 = 1050$ ,

difference = 50

**Q-12 A man sells two tables at the same price. On one he makes a profit of 10% and on the other he suffers a loss of 10%. Find the loss or gain percentage on the whole transaction.**

**[Odisha Police SI 2019]**

- (A) 1%
- (B) 0.1%
- (C) 0%
- (D) Indeterminate

**ANS-** (A) 1%

**Given:**

→ Both tables are sold at the same price, one at +10% and one at -10%



**Same SP = 99 each**

|         |
|---------|
| Table 1 |
| CP 90   |
| +10%    |

|         |
|---------|
| Table 2 |
| CP 110  |
| -10%    |

Total CP = 200, total SP = 198

**Loss = 2 on 200 = ?**

**Concept:**

→  $CP = \frac{SP \times 100}{100 + \text{Profit}\%}$  for the profit table and  $CP = \frac{SP \times 100}{100 - \text{Loss}\%}$  for the loss table

**Solution:**

→ Take SP of each table = 99 (a number divisible by 11 and 9)

⇒ CP of profit table =  $\frac{99 \times 100}{110} = 90$

⇒ CP of loss table =  $\frac{99 \times 100}{90} = 110$

→ Total CP = 200, total SP = 198, so loss = 2

→ Loss % =  $\frac{2}{200} \times 100 = 1\%$

∴ Ans: (A) 1%

**Hint:**

→ Shortcut: equal SP with the same profit and loss % x always gives a loss of  $\frac{x^2}{100} \%$   
 $= \frac{10^2}{100} = 1\%$

**Q-13 I remember my sister taking me to the museum.**

**[Odisha Police SI 2022]**

- (A) I remember taken to the museum by my sister.
- (B) I remember myself being taken to the museum by my sister.
- (C) I remember I was taken to the museum by my sister.
- (D) I remember being taken to the museum by my sister.

**ANS-** (D) I remember being taken to the museum by my sister.

**Explanation:** I remember **being taken** to the museum by my sister. ମୂଳ ବାକ୍ୟରେ "remember" ପରେ "my sister taking me" (Gerund, V-ing) ଅଛି। Gerund କୁ Passive କଲେ ଏହା **being + V3** ହୁଏ। ଏଠାରେ **remember** ର କର୍ତ୍ତା ଓ **taking** ର କର୍ମ **me** ଦୁହେଁ ରୋଗିଏ ବ୍ୟକ୍ତି (ମୁଁ), ତେଣୁ "I remember being taken", ଓ ଶେଷରେ **my sister** → **by my sister**। ଅର୍ଥାତ୍ ମୋତେ ମନେ ଅଛି ଯେ ମୋ ଭଉଣୀ ମୋତେ ସଂଗ୍ରହାଳୟକୁ ନେଇଥିଲେ। **A passive gerund is formed with "being + V3".**



**Trick: Remember / enjoy / avoid ପରେ V-ing ଥିଲେ Passive ରେ being + V3 ଲେଖ:**

| Active ରୂପ                           | Passive ରୂପ                     | ଉଦାହରଣ                                       |
|--------------------------------------|---------------------------------|----------------------------------------------|
| <b>Gerund (taking)</b>               | <b>being + V3 (being taken)</b> | <b>I remember being taken to the museum.</b> |
| <b>Perfect Gerund (having taken)</b> | having been + V3                | He denied having been seen.                  |
| <b>Infinitive (to take)</b>          | to be + V3                      | She wants to be taken.                       |

**Other Options:**

**(A) I remember taken to the museum by my sister.** — ଏଥିରେ "being" ନାହିଁ; **remember** ପରେ Passive Gerund ପାଇଁ **being + V3** ଲାଗେ, ଯେପରି **being taken**।

**(B) I remember myself being taken to the museum by my sister.** — **myself** ଏକ Reflexive Pronoun; କର୍ତ୍ତା ଓ କର୍ମ ଏକା ବ୍ୟକ୍ତି ହେଲେ ଅଲଗା **myself** ଲେଖିବାର ଦରକାର ପଡ଼େ ନାହିଁ, ଯେପରି **I enjoy being praised**.

**(C) I remember I was taken to the museum by my sister.** — ଏହା **Clause (I was taken)** ଦ୍ୱାରା ଲେଖା **Simple Past Passive**; ଅର୍ଥରେ ପାଖାପାଖି, କିନ୍ତୁ Voice ପରିବର୍ତ୍ତନ ପ୍ରଶ୍ନରେ ମୂଳ ଗଠନ **remember + V-ing** ରଖି **being taken** ଲେଖାଯାଏ।

**Q-14 At a game of billiards, A can give B 15 points in 60 and A can give C 20 points in 60. How many points can B give C in a game of 90 ?**

**[Odisha Police SI 2022]**

- (A) 30 points
- (B) 20 points
- (C) 10 points
- (D) 12 points

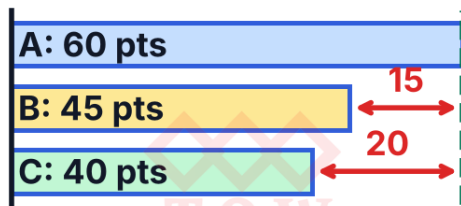
**ANS-** (C) 10 points

**Given:**

- A gives B 15 points in 60, so when A scores 60, B scores  $60 - 15 = 45$
- A gives C 20 points in 60, so when A scores 60, C scores  $60 - 20 = 40$
- Required: points B can give C in a game of 90



Start 60 pts



Game of 60 points

B : C = 45 : 40

In 90: B 90, C 80

**B gives C = ?**

**Concept:**

→ In the same time, points scored are in the ratio of the players' speeds  
→ A scores 60 in both cases, so A is the common link

**Solution:**

→ B : C = 45 : 40 = 9 : 8

→ In a game of 90, B scores 90

⇒ C scores  $\frac{8}{9} \times 90 = 80$

→ B gives C  $90 - 80 = 10$  points

∴ Ans: (C) 10 points

**Hint:**

→ Alternative: C's points when B has 90 =  $90 \times \frac{40}{45} = 80$ , so the start is 10

**Q-15 At what time after 9 am, do hands of clock make a right angle?**

**[Odisha Police SI 2022]**

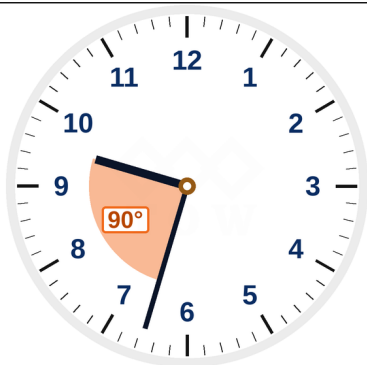
- (A) At  $32\frac{8}{11}$  minutes past 9 am  
(B) At 9 am  
(C) At 3 pm  
(D) At  $29\frac{8}{11}$  minutes before 10 am

**ANS-** (A) At  $32\frac{8}{11}$  minutes past 9 am

**Given:**

→ After 9 am, the hands of the clock make a right angle ( $90^\circ$ )





**Concept:**

→ At 9 o'clock the hour hand is at  $9 \times 30 = 270^\circ$  and the minute hand at 0, so the minute hand is  $270^\circ$  behind the hour hand.

→ The minute hand gains  $5.5^\circ$  per minute; the next right angle comes when the gap falls to  $90^\circ$ , i.e. after a gain of  $270 - 90 = 180^\circ$ .

**Solution:**

$$\rightarrow \text{Minutes needed} = \frac{180}{5.5} = \frac{360}{11} = 32 \frac{8}{11}$$

$$\Rightarrow \text{Check: minute hand} = 6 \times \frac{360}{11} = 196 \frac{4}{11}^\circ$$

$$\Rightarrow \text{Hour hand} = 270 + \frac{360}{22} = 286 \frac{4}{11}^\circ, \text{ difference} = 90^\circ$$

→ 9:00 itself is also a right angle, but the question asks for the time after 9 am, so the next one is at  $32 \frac{8}{11}$  minutes past 9

∴ Ans: (A) At  $32 \frac{8}{11}$  minutes past 9 am

**Shortcut:**

→ Minute hand  $\theta$  behind the hour hand:  $\frac{60h - 2\theta}{11}$  min past  $h$ ; for 9 and  $90^\circ$ :

$$\frac{540 - 180}{11} = \frac{360}{11} = 32 \frac{8}{11} \text{ min}$$

**Q-16** From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?

[Odisha Police SI 2022]

- (A) 564
- (B) 645
- (C) 735
- (D) 756

ANS- (D) 756

**Given:**

→ 7 men and 6 women; committee of 5 persons

→ At least 3 men



**Concept:**

→ Selection:  ${}^nC_r = \frac{n!}{r!(n-r)!}$

→ At least 3 men means (3 men + 2 women) or (4 men + 1 woman) or (5 men + 0 women)

**Solution:**

→ 3 men, 2 women:  ${}^7C_3 \times {}^6C_2 = 35 \times 15 = 525$

→ 4 men, 1 woman:  ${}^7C_4 \times {}^6C_1 = 35 \times 6 = 210$

→ 5 men:  ${}^7C_5 = 21$

→ Total =  $525 + 210 + 21 = 756$

∴ Ans: (D) 756

**Hint:**

→ Alternative: all committees  ${}^{13}C_5 = 1287$ ; subtract those with fewer than 3 men:  $6 + 105 + 420 = 531$

⇒  $1287 - 531 = 756$

**Q-17 Identify the Blood Relations (puzzle) :-** If Neena says, "Anita's father Raman is the only son of my father-in-law Mahipal", then how is Bindu who is the sister of Anita, related to Mahipal?

[Odisha Police SI 2022]

- (A) Niece
- (B) Daughter
- (C) Wife
- (D) None of these

ANS- (D) None of these





Mahipal

ONLY SON



Raman

COUPLE



Neena

SISTERS



Anita



Bindu

**STEP 1** Mahipal is Neena's father-in-law, so her husband is his son. His only son is Raman, so Raman is Neena's husband.

**STEP 2** Anita and her sister Bindu are the daughters of Raman and Neena.

**STEP 3** Bindu is Mahipal's son's daughter, so she is his granddaughter, not niece, daughter or wife.

**HINT:** Only son of father-in-law = the husband. Bindu is his daughter.

**FINAL ANSWER: GRANDDAUGHTER**

**Q-18** The length of a ladder is exactly equal to the height of the wall it is leaning against. If the lower end of the ladder is kept on a stool of height  $3m$  and the stool is kept  $9m$  away from the wall, the upper end of the ladder coincides with the top of the wall. Then the height



of the wall is

[Odisha Police SI 2023]

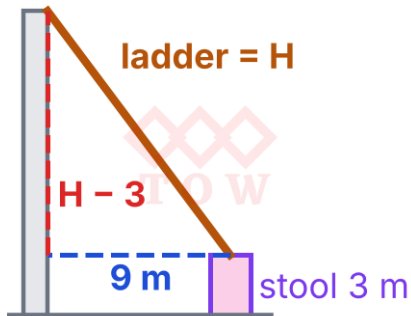
- (A) 15 m
- (B) 12 m
- (C) 18 m
- (D) 11 m

ANS- (A) 15 m

**Given:**

- Ladder length = wall height = H
- Stool height = 3 m, stool is 9 m from the wall
- Top of the ladder touches the top of the wall

**H = ?**



**Concept:**

- Pythagoras: Hypotenuse<sup>2</sup> = Base<sup>2</sup> + Height<sup>2</sup>
- Ladder is the hypotenuse, base = 9 m, height = H - 3 (wall top above the stool top)

**Solution:**

$$\begin{aligned} \rightarrow H^2 &= 9^2 + (H - 3)^2 \\ \Rightarrow H^2 &= 81 + H^2 - 6H + 9 \\ \Rightarrow 6H &= 90 \\ \Rightarrow H &= 15 \text{ m} \\ \therefore \text{Ans: (A) } 15 \text{ m} \end{aligned}$$

**Hint:**

- Check: height = 15 - 3 = 12, and the triplet 9, 12, 15 gives  $9^2 + 12^2 = 15^2$  (81 + 144 = 225)

**Q-19** If three equal cubes are placed adjacently in a row, then the ratio of the total surface area of the new cuboid to that of the sum of the surface areas of the three cubes will be

[Odisha Police SI 2023]

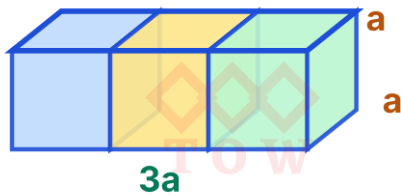
- (A) 5:9
- (B) 1:3
- (C) 2:3
- (D) 7:9



ANS- (D) 7:9

**Given:**

- Three equal cubes of side  $a$  placed in a row
- New cuboid: length  $3a$ , breadth  $a$ , height  $a$



3 cubes:  $3 \times 6a^2 = 18a^2$

**Cuboid =  $14a^2$  Ratio = ?**

**Concept:**

- Cube: surface area =  $6a^2$
- Cuboid: surface area =  $2(lb + bh + hl)$

**Solution:**

- Three cubes:  $3 \times 6a^2 = 18a^2$
- Cuboid:  $2(3a \times a + a \times a + a \times 3a) = 14a^2$
- Ratio =  $14a^2 : 18a^2 = 7 : 9$
- ∴ Ans: (D) 7 : 9

**Hint:**

- Alternative: joining hides 2 faces at each of the 2 joints, i.e. 4 faces of area  $a^2$ , so cuboid =  $18a^2 - 4a^2 = 14a^2$

**Q-20 What is the correct chronological order of the formation of the following?**

1. Prarthana Samaj
2. Ramakrishna Mission
3. Theosophical Society
4. Arya Samaj

**[Odisha Police SI 2023]**

- (A) 1,3,4,2
- (B) 1,4,3,2
- (C) 3,2,1,4
- (D) 4,2,1,3

ANS- (B) 1,4,3,2

**Explanation:** The correct order is **Prarthana Samaj (1867)**, **Arya Samaj (1875)**, **Theosophical Society (1875)** and **Ramakrishna Mission (1897)**. Arya Samaj was founded by **Dayanand Saraswati** on **10 April 1875** at Bombay. The Theosophical Society began in New York on **17 November 1875**, and its headquarters moved to Adyar, Madras, in 1882.





| Body                        | Founder                       | Year         |
|-----------------------------|-------------------------------|--------------|
| <b>Prarthana Samaj</b>      | Atmaram Pandurang             | 1867         |
| <b>Arya Samaj</b>           | Dayanand Saraswati            | 1875 (April) |
| <b>Theosophical Society</b> | Madame Blavatsky, Col. Olcott | 1875 (Nov)   |
| <b>Ramakrishna Mission</b>  | Swami Vivekananda             | 1897         |

**Key Points:**

- ✦ *Prarthana Samaj*: **M. G. Ranade and R. G. Bhandarkar** worked for it in Maharashtra
- ✦ *Arya Samaj* motto: **Go back to the Vedas**
- ✦ *Ramakrishna Mission*: **founded on 1 May 1897 in Calcutta, headquarters now at Belur Math**

**Other Options:**

- (A) **1,3,4,2** — The Theosophical Society (1875) was started in New York with Annie Besant joining in 1889.
- (C) **3,2,1,4** — Ramakrishna Mission (1897) ran famine relief in Murshidabad in 1897 and plague relief in Calcutta in 1899.
- (D) **4,2,1,3** — Arya Samaj (1875) set up its first school at Lahore, the DAV School of 1886.





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