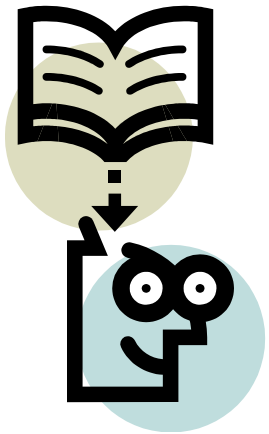

GENERAL APTITUDE

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Races(TEST)

Q. Two friends P & Q start from same point at the same time on a circular track 336 mt long in opposite directions at 6 m/s & 8 m/s respectively. When they meet again at the starting point for the first time they will be meeting on the track for ‘n’th time. So what is ‘n’?

A. 56 sec B. 112 sec C. 168 sec D. 214 sec

Ans : C

Variation(TEST)

Q. The value of a coin varies directly as the square of its diameter, thickness remaining constant. The value also varies directly as the thickness ,the diameter remaining constant. Two coins have their diameters in the ratio 4 : 3. If their values are in the ratio 4:1 find the ratio of their thickness

A. 7:4 B. 7:5 C. 9:4 D. 9:5

Ans: C

- **Boats & Streams**
- If Speed of boat in still water = **x kmph**
- Speed of the stream = **y kmph** then

- Speed of the boat downstream **Sd = (x+y) kmph**
- Speed of the boat upstream **Su = (x-y) kmph**

- Speed of Boat in still water **X = ½ (Sd + Su)**
- Speed of the stream **Y = ½ (Sd – Su)**

Time & Distance

Q. A person covers 200 m in 15 sec while going upstream & 5 km in 3 min while going downstream. Find the speed of boat in still water.

A. 44 m/s B. 74 m/s C. 74 km/hr D. 80 km/hr

Soln

Case A : **Su = 200/15 = 40/3**

Case B : **Sd = 5000/180 = 500/18 = 250/9**

Sw = ½(Sd+Su)

= ½(250/9 +40/3)

= ½(370/9)

= 370/18 m/s x 18/5

= 74 km/hr

Ans C

Time & Distance

Q. A man rows at the rate of 5 kmph in still water. If the river flows at 1.5 kmph it takes him 1 hr to row to a place & back. What is the distance between the two places?

A. 2 km B. 2.5 km C. 2.75 Km D. 2.275 km

Soln

Sd = 5 + 1.5 = 6.5 kmph

Su = 5 – 1.5 = 3.5 kmph

If distance between two places is x,

Time for downstream = Td & Upstream = Tu,

Total time = Td + Tu

= x/Sd + x/Su

Total time = (x / 6.5 + x / 3.5)

1 = (x / 6.5 + x / 3.5)

X = 2.275 km.

Ans D

Time & Distance

Q. A boat goes 16 km upstream & returns back to original place in 6 hrs. If the speed of water is 2 kmph. Find the speed of boat in still water.

A.3 kmph B. 4 kmph C. 6 kmph D. 8 kmph

Soln

Let speed of boat = x, Speed of water y = 2

Case A : **Su = x-2**

Case B : **Sd = x+2**

Total time = Tu + Td

6 = 16/(x -2) + 16/(x+2)

6(x-2)(x+2) = 16(x+2) + 16(x-2)

6x^2 -24 = 16(2x)

6x^2 – 32x -24 =0

3x^2 -16x – 12 =0 → 3x^2 -18x + 2x -12 =0 → (3x+2)(x-6)=0

→ X = 6 kmph

Ans C

Time & Distance

Q. A man notices that it takes him thrice the time to row up than to row down the same distance. Find the speed of the boat in still water if the speed of water is 5 kmph?

A. 8 kmph B. 8.5 kmph C. 10 Kmph D. 10.5 kmph

Soln

Td : Tu = 1 : 3 → Sd : Su = 3 : 1

Let speed of boat = x, Speed of water = 5

→Sd = x+5, Su = x-5

→Sd/Su = (x+5)/(x-5)

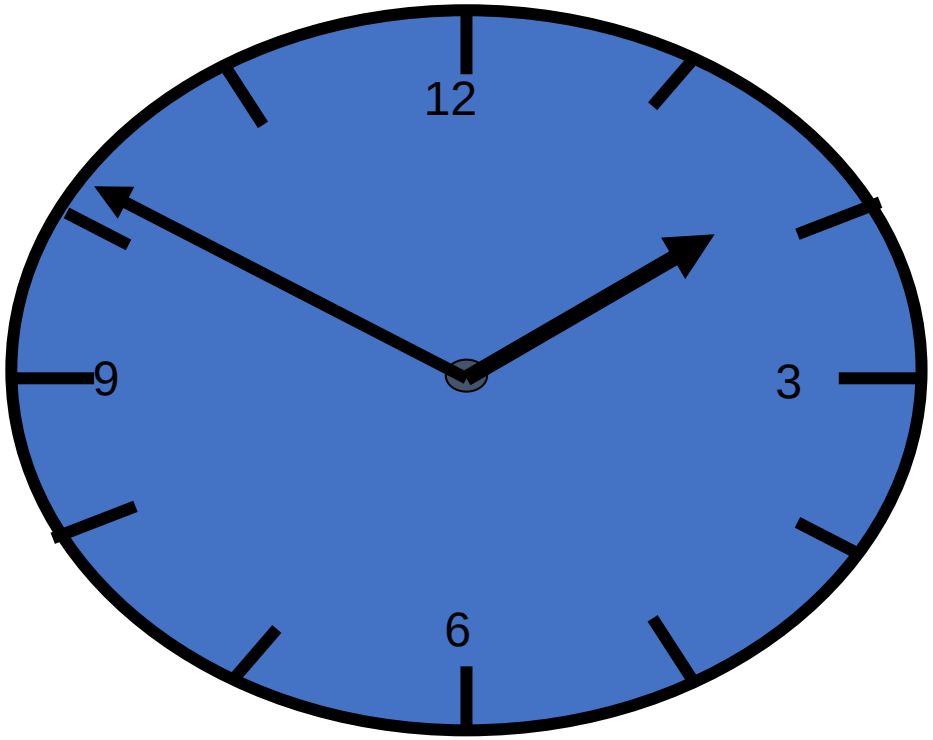
→3/1 = (x+5)/(x-5)

→3(x-5) = x+5

→3x-15 = x+5 → 2x =20 → x= 10 kmph.

- **Ans C**

Clocks



- → 360°
- → 60 minute spaces of 6° each
- → 12 Hours space of 30° each

Clocks

- 12 hr x 30° = 360°
- At night 12, day starts , both hands are at same place.
- Every hour they coincide once **but between 11-12 it coincides at 12**, so its 11 times only.
- The two hands coincide -
  - 11 times in 12 hours
  - 22 times in 24 hours
- The two hand are in opposite direction –
  - 11 times in 12 hours
  - 22 times in 24 hours
  - **Between 5-7 it happens only once at 6 o'clock.**
- The two hand make right angles –
  - 22 times in 12 hours
  - 44 times in 24 hours

Clocks

- The hands of a clock coincide 11 times in every 12 hours (Since between 11 and 1, they coincide only once, *i.e.,* at 12 o'clock).

AM	**PM**
12:00	12:00
1:05	1:05
2:11	2:11
3:16	3:16
4:22	4:22
5:27	5:27
6:33	6:33
7:38	7:38
8:44	8:44
9:49	9:49
10:55	10:55

The hands overlap about every 65 minutes, not every 60 minutes.

∴ The hands coincide 22 times in a day.

Clocks

Q. An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

A. 144º B. 150º C. 168º D. 180º

- Soln:
- In one hour ----- the hour hand rotates 30°
- In 6 hours ------ the hour hand rotates 180°
- **OR**
- Number of hours from 8am till 2pm= 6hrs
  The rotation of an hour hand in one hour= 30°
  Total degree of rotation= 360°

  Therefore, the Angle traced by the hour hand in 6 hours is= (360/12)x6 = **180°**
- **Ans: D**

Clocks

Q. At what time between 4 and 5 o'clock will the hands of a watch be together/coincide?

A. $10\ ^{9}/_{11}$ min past 4 B. $21\ ^{10}/_{11}$ min past 4 C. $11\ ^{10}/_{11}$ min past 4 D. $21\ ^{9}/_{11}$ min past 4

Soln:

$\theta = |30H - 11/2\ M|$ OR $|30H - 5.5\ M|$

$0 = 30 \times 4 - 11/2 \times M$

$0 = 120 - 11/2 \times M$

- $M = 240/11$ mins

  $= 21\ \frac{9}{11}$ mins. past 4

- **Ans: D**

Clocks

Q. At what time between 3 & 4 o'clock will the hands of the clock be in the opposite direction.

A. 40 $^{9}/_{11}$ min past 3 B. 30 $^{10}/_{11}$ min past 3

C. 49 $^{1}/_{11}$ min past 3 D. 41 $^{9}/_{11}$ min past 3

- $\theta = |11/2\ M - 30H|$

$180 = 11/2M - 30 \times 3$

$180 = 11/2M - 90$

$270 = 11/2\ M$

$M = 540/11$ mins

$= 49\ \frac{1}{11}$ mins. past 3

Ans : C

Clocks

Q. At what time between 7 and 8 o'clock will the hands of a clock be in the same straight line but, not together?

A. 5 min. past 7 B.5 $\frac{2}{11}$ min. past 7 C. 5 $\frac{3}{11}$ min. past 7 D. 5 $\frac{5}{11}$ min. past 7

Soln:

θ = |30H – 11/2 M| OR |30H – 5.5 M|

180 = 30 x 7 - 11/2 x M

180 = 210 - 11/2 x M

11/2M =210-180

M = 60/11 mins

= 5 $\frac{5}{11}$ mins. past 7

- **Ans: D**

Clocks

Q. At what time between 5.30 and 6 will the hands of a clock be at right angles?

A. $5\frac{2}{11}$ min. past 5 B. $43\frac{7}{11}$ min. past 5 C. 40 min. past 5 D. 45 min. past 5

Soln:

$\theta = |11/2\ M - 30H|$

$90 = 11/2\ M - 30 \times 5$

$11/2\ M = 240$

$M = 480/11$ mins

$= 43\frac{7}{11}$ mins. past 5

Ans: B

Clocks

Q. What is the angle between the hands of a clock at 7:23 am?

A.90° B. 85.5° C. 83.5° D. 81.5°

Soln:

Angle θ = 30H – 11/2 M

= 30 x 7 – $\frac{11}{2}$ x 23

= 210 - 253/2

= 210 – 126.5

= 83.5°

Ans : C

Clocks

Find the reflex angle between 2 hands of a clock at 10:25

A. 187.5° B. 192.5° C. 197.5° D. 207.5°

Soln:

$\theta = |30H - 11/2\ M|$ OR $|30H - 5.5\ M|$

$= 30 \times 10 - 11/2 \times 25$

$= 300 - 275/2$

$= 300 - 137.5$

$= 162.5\ °$

But reflex angle is greater than 180 ° and less than 360 °

$360 - 162.5 = 197.5\ °$

- **Ans: C**

Clocks

Q. Find non reflex angle between 2 hands of a clock at 10:10

Soln:

$\theta = |30H - 11/2\ M|$ OR $|30H - 5.5\ M|$

$= 30 \times 10 - 11/2 \times 10$

$= 300 - 55$

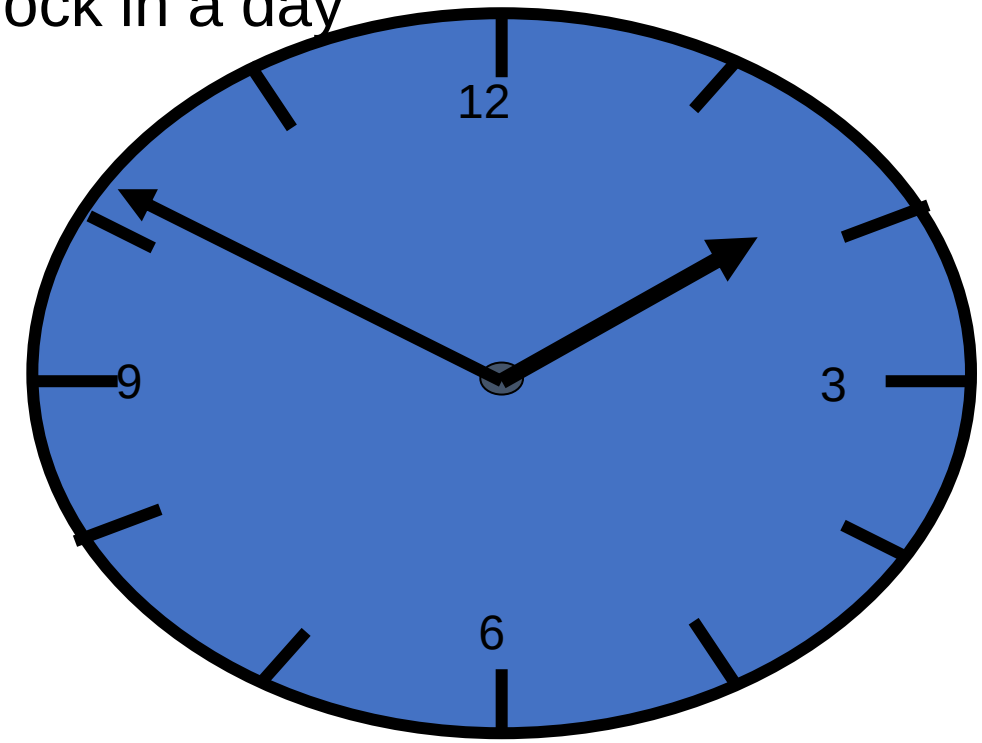
$= 245°$ ---- > its a reflex angle > 180°

But reflex angle is greater than 180 ° and less than 360 °

360 -245 = 115° ----→ non reflex angle

Clocks

Gain/loss by minute hand over hour hand of a clock in a day



Clocks(Assignment)

Q. What is the angle between the hands of a clock at 7:20 ?

A. 100° B. 1921/2° C. 195° D. 197 1/2°

Ans : A

What is the angle between the hands of a clock at 2:30 ?

A. 144° B. 150° C. 105° D. 180°

Ans : C

What is the angle between the hands of a clock at 3:30 ?

A. 144° B. 150° C. 105° D. 75°

Ans : D

THANK YOU