Quiz Date: 21st August 2020

Q1. Hari and Ravi started a race from opposite ends of the pool. After a minute and a half, they passed each other in the centre of the pool. If they lost no time in turning and maintained their respective speeds, how many minutes after starting did they pass each other the second time?
(a) 3
(b)4 ½
(c)6
(d)7 ½
(e) 5 ½

Q2. Inside a square plot, a maximum sized circular garden is developed which exactly fits in the square plot and the side of the square plot is 28 metres. What is the area of the space left out in the square plot after developing the garden?
(a) 98 m^2
(b) 146 m^2
(c) 84 m^2
(d) 168 m^2
(e) 164 m^2

Q3. In how many ways can Ram arrange the letters of the word ALLAHABAD?
(a) 7650
(b) 7560
(c) 6750
(d) 5760
(e) 7660

Q4. In how many ways can a person sent invitation cards to 6 of his friends if he has four servants to distribute the cards?
(a) 6^4
(b) 4^6
(c) 24
(d) 120
(e) 36

Q5. A bag contains 5 red, 4 green and 3 black balls. If three balls are drawn out of it at random, find the probability of drawing exactly 2 red balls.
(a) 7/22
(b) 10/33
(c) 7/12
(d) 7/11
(e) None of these

Q6. From a group of 7 men and 4 women a committee of 6 persons is formed. What is the probability that the committee will consist of exactly 2 women?
(a) 5/11
(b) 3/11
(c) 4/11
(d) 2/11
(e) 6/11

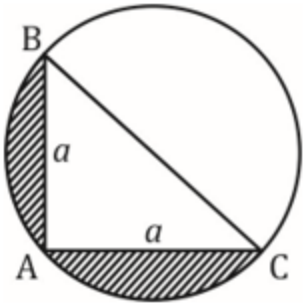
Q7. A plane left 30 minute later than its schedule time to reach destination 1500 km away. In order to reach in time, it increased its speed by 250 km/hr. What is its original speed?
(a) 1000 km/hr
(b) 750 km/hr
(c) 600 km/hr
(d) 800 km/hr
(e) 650 km/hr

Q8. There are 8 consonants and 5 vowels in a word jumble. In how many ways can we form 5 -letter words having three consonants and 2 vowels?
(a) 67200
(b) 8540
(c) 720
(d) Data Inadequate
(e) None of these

Q9. The base of a triangular field is three times of its altitude. If the cost of cultivating the field at Rs 50 per hectare be Rs 675, find its base and height. (1 hectare = 10000 m^2)
(a) 900 m , 300 m
(b) 350 m , 850 m
(c) 750 m , 450 m
(d) 875 m, 325 m
(e) None of these

Q10. Sameer can row a certain distance downstream in 24 hours and can come back covering the same distance in 36 hours. If the stream flows at the rate of 12 kmph, find the speed of Sameer in still water.
(a) 30 kmph
(b) 15 kmph
(c) 40 kmph
(d) 60 kmph
(e) 50 kmph

Q11. If BC passes through centre of the circle, then the area of the shaded region in the given figure is:



(a) $\frac{a^2}{2}(3-\pi)$

(b) $a^2\left(\frac{\pi}{2}-1\right)$

(c) $2a^2(\pi-1)$

(d) $\frac{a^2}{2}\left(\frac{\pi}{2}-1\right)$

(e) None of these

Q12. A thief steals a car at 2.30 pm and drives it at 60 kmph. The theft is observed at 3 pm and the owner sets off in another car at 75 kmph. When will he overtake the thief?
(a) 6:00 pm
(b) 5:30 pm
(c) 5:00 pm
(d) 6:30 pm
(e) 4:30 pm

Q13. The area of a rectangle gets reduced by 9 m^2, if its length is reduced by 5m and breath increased by 3m. If we increase the length by 3m and breath by 2m, the area is increased by 67m^2. The length of the rectangle is:
(a) 17
(b) 9
(c) 18
(d) 11
(e) 13

Q14. A hollow spherical shell is made of metal of density 4.8 g/cm^3, If its internal and external radii are 10 cm and 12 cm respectively, find the weight of the shell
(a) 15.24 kg
(b) 12.84 kg
(c) 14.64 kg
(d) 16.46 kg
(e) None of these

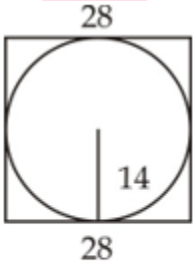
Q15. Find the lateral surface area of a regular pyramid with triangular base, if each edge of the base measures 8 cm and slant height is 5 cm
(a) 50
(b) 60
(c) 55
(d) 65
(e) 75

Solutions

S1. Ans.(b)
Sol.

Ist meeting $\rightarrow \frac{3}{2}$ minutes
In 2nd meeting, they will have to cover double distance than their 1st meetings.
$\therefore$ Total time $= \frac{3}{2} + \frac{3}{2} \times 2 = 4\frac{1}{2}$ minutes

S2. Ans.(d)
Sol.



Required area
$= 28 \times 28 - \frac{22}{7} \times 14 \times 14$
$= 784 - 616 = 168\ m^2$

S3. Ans.(b)
Sol.
ALLAHABAD
$\therefore$ Total required ways
$= \frac{9!}{4! \times 2!}$ (since 4 A's and 2 L's)
$= \frac{9 \times 8 \times 7 \times 6 \times 5}{2 \times 1}$
$= 7560$

S4. Ans.(b)
Sol.
Total ways = $4\times4\times4\times4\times4\times4$
$= 4^6$

S5. Ans.(a)
Sol.
The favorable cases may be as (2R, 1G) or (2R, 1B)
$= \frac{^5C_2\times{}^4C_1}{^{12}C_3} + \frac{^5C_2\times{}^3C_1}{^{12}C_3}$
$= \frac{2}{11} + \frac{3}{22}$
$= \frac{7}{22}$

S6. Ans.(a)
Sol.
7M, 4W members in committee = 6
The favorable case may be → (2W, 4M)
∴ Required probability = $\frac{^4C_2\times{}^7C_4}{^{11}C_6}$
$= \frac{6\times35}{462}$
$= \frac{5}{11}$

S7. Ans.(b)
Sol.

Let original speed was x km/hr. and
actual time was t hours

$\therefore x\left(t+\frac{1}{2}\right)=1500 \quad \ldots(i)$

and, $(x+250)\,t=1500 \ldots(ii)$

$\therefore xt+\frac{x}{2}=xt+250t$

$\Rightarrow x=500t$

From (i),

$500t\left(t+\frac{1}{2}\right)=1500$

$\Rightarrow 2t^2+t-6=0$

$\Rightarrow 2t^2+4t-3t-6=0$

$\Rightarrow t=\frac{3}{2}$ hours

$\therefore x=500\times\frac{3}{2}$

$=750$ km/hr

S8. Ans.(a)
Sol.

Total ways $= {}^8C_3 \times {}^5C_2 \times 5!$

$=\frac{8\times7\times6}{3\times2}\times\frac{5\times4}{2}\times120$

$=67{,}200$

S9. Ans.(a)
Sol.

Area of the field

$=\frac{\text{Total cost}}{\text{Rate}}=\frac{675}{50}$

$=13.5$ hectares

$=(13.5\times(10000)\ m^2$

$=135000\ m^2$

Let altitudes $= x$ m

$\therefore$ base $= 3x$ m

Now, $\frac{1}{2}\times3x\times x=135000$

$\Rightarrow x^2=90000$

$\Rightarrow x=300$ metres

& base 900 metres

S10. Ans.(d)
Sol.

Let speed of Sameer in still water = v kmph

$\Rightarrow (v-12)\times 36 = (v+12)\times 24$

$\Rightarrow 3v - 36 = 2v + 24$

$\Rightarrow v = 60\ kmph$

S11. Ans.(d)

Sol.

Area of Triangle $= \frac{1}{2}a^2$

Area of half – circle $= \frac{1}{2}\pi \times \left(\frac{\sqrt{2}}{2}a\right)^2$

$= \pi\, a^2\, /4$

$\therefore$ Area of shaded Region

$= \pi a^2/4 - \frac{1}{2}a^2$

S12. Ans (c)

Sol.

Both the persons are in motion at 3 pm, hence distance between the two persons at 3 pm = 30 km (because the thief has travelled 30 km in half an hour)

Relative speed = (75–60) = 15 kmph

Distance to be covered = 30 km

Hence, time taken by the owner in overtaking the thief = 30/15= 2 hours

Therefore, owner will overtake the thief at 2 hours after 3 pm i.e. at 5 pm

S13. Ans (a)

Sol.

Let the length is x and breath is y

So, as per question

$xy - (x-5)(y+3) = 9$

$3x - 5y = 6$ .....(i)

$(x+3)(y+2) - xy = 67$

$2x + 3y = 61$ .....(ii)

Solving (i) and (ii) we get x = 17 and y = 9

S14. Ans.(c)

Sol.

Volume of the shell $= \frac{4}{3}\pi(12^3 - 10^3)$

$= \frac{4}{3} \times \pi \times (12 - 10)(144 + 120 + 100)$

$= \frac{4}{3} \times \frac{22}{7} \times 2 \times 364$

$= \frac{9152}{3}\ \text{cm}^3$

$\therefore$ Weight of shell $= \frac{9152}{3} \times 4.8$ gm

= 14643.2 gm

= 14.64 kg

S15. Ans.(b)

Sol.

Edge of base = 8 cm

Slant height of pyramid = 5 cm

$\therefore$ Lateral surface area

$= \frac{1}{2} \times (Perimeter\ of\ base) \times (slant\ height)$

$= \frac{1}{2} \times (3 \times 8) \times 5$

= 60 cm^2