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SRCC GBO 2016

Quantitative ability

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Quantitative ability

Instructions

For the following questions answer them individually

Question 1

Seven hundred twenty sweets were distributed equally amongst children, in such a way that number of sweets received by each child is 20% of the total number of children. How many sweets did each child receive?

A 12

B 14

C 11

D 15

Answer: A

Explanation:

Total number of sweets distributed = 720 Let total children = 100x Number of sweets received by each child = 20% of 100x = 20x Total number of sweets =100x * 20x = 720

$$x^2 = 0.36$$

$$x = 0.6$$

Total number of sweets did each child receive = 20x = 12

Question 2

15% of the people eligible to vote are between 18 and 25 years of age. In an election, 75% of those eligible to vote, who are between 18 and 25, actually voted. In that election, the number of persons between 18 and 25, who actually voted was what percent of those eligible to vote?

A 12.50%

B 10.75%

C 11.25%

D 10.25%

Answer: C

Explanation:

Let eligible voters = 100x Eligible voters between 18 and 25 years of age = 15% of 100x = 15x Eligible voters between 18 and 25 years of age who actually voted = 75% of 15x = 11.25x

Required percent=$\frac{11.25x}{100x} \times 100 = 11.25\%$

Question 3

What is the sum of the total surface areas of all the cubes formed when a cuboid of size 5.2m × 13m × 39m is cut completely into the least possible number of cubes, all of which arg identical?

A   6164 sq m

B   30452 sq m

C   6084 sq m

D   6760 sq m

Answer: C

Explanation:

LCM of sides of cuboid = 2.6 So, side of each cube = 2.6 m

Least number of cubes formed= $\frac{5.2 \times 13 \times 39}{2.6 \times 2.6 \times 2.6} = 150$

Total surface area of each =$6 \times 2.6^2 = 40.56m^2$

Sum of total surface area of all the cubes= $150 \times 40.56m^2$

Sum of total surface area of all the cubes =$150 \times 40.56 = 6084m^2$

Question 4

A tank of capacity 1000 cubic centimeter is being filled with water by 3 pipes A, B and C. The areas of cross-section of the pipes A, B and C are"in the ratio 3: 2: 4. Water is flowing through each of these pipes at a different rate in cm/min.twas found that the time taken to fill the tank which was initially empty by the pipes A, B and individually is 20 minutes, 50 minutes and 25 minutes respectively. Find the ratio of the-rates of flow of water through the pipes A and C.

A   20:9

B   5:3

C   3:5

D   9:20

Answer: E

Question 5

Three men, four women and six children can complete a work in seven days. A woman docs double the work a man does and a-child does half the work a man does. How many women alone can complete the work in 7 days?

A   7

B   8

C   12

D   None of these

Answer: A

Explanation:

According to the question: Total work = (3M + 4W + 6C) * 7

Now, A woman does double the work a man does, So, the ratio of efficiency of a man to that of a woman = 1: 2

M: W = 1: 2

2M = W .... (1)

A child does half the work a man does.

So, the ratio of efficiency of a man to that of child = 2: 1

M: C = 2: 1

M = 2C .... (2)

From (1) and (2): 4C = W .... (3)

Let the required number of women = 'x'

Now, (3M + 4W + 6C) * 7 = (xW) * 7

From (1) and (3): 1.5W + 4W + 1.5W = xW

7W = xW

x = 7

Question 6

A can do a piece of work in 36 days, B in 54 days and C in 72 days. All the three began the work together but A and B left 8 days and 12 days before the completion of the work respectively. How many days in all did C put in till the entire work was finished?

A   24 days

B   29 days

C   20 days

D   32 days

Answer: A

Explanation:

Let total time taken to complete the work = 'x' days C work for 'x' days. A left 8 days before the completion of the work. So, A works for 'x - 8' days B left 12 days before the completion of the work. So, B works for 'x - 12' days

Now,

$$\frac{x-8}{36} + \frac{x-12}{54} + \frac{x}{72} = 1$$

$$\frac{6(x-8) + 4(x-12) + 3x}{216} = 1$$

$$6x - 48 + 4x - 48 + 3x = 216$$

$$x = 24$$

Hence, C works for total 24 days.

Question 7

In a group of 5 boys the 2nd boy is twice as efficient as the 1st boy. The 3rd boy is twice as efficient as the 2nd boy and so on. All of them working together will take 5 days to complete a job. How much extra time will the 2nd and 4th boys take working together as compared to the 5th boy working alone to complete the same job approximately

A   3 days

B   6 days

C   8 days

D   10 days

Answer: B

Explanation:

Ratio of efficiency of 1st boy to 2nd boy = 1: 2

Ratio of efficiency of 2nd boy to 3rd boy = 1: 2

And so on...

So ratio of efficiency of 1st, 2nd, 3rd, 4th and 5th boy = 1: 2: 4: 8: 16

Let unit of work done by 1st, 2nd, 3rd, 4th and 5th boy is 1, 2, 4, 8 and 16 respectively

Since, job is completed by all the five boys together in 5 days.

Hence, total work = 5 * (1 + 2 + 4 + 8 + 16) = 155

Time taken by 2nd and 4th boys together to do the work=$\frac{155}{2+8} = 15.5\ days$

Time taken by 5th boy alone to do the work =$\frac{155}{16}$ days.

Required difference =$15.5 - \frac{155}{16} = \frac{93}{16} = 5.8125\ days = 6\ days\ approx$

Question 8

How many hours will atul ,Shiva, sapan take to finish their assignment together if atul alone can do it in six hours more , shiv alone do it in one hour more ,and sapan alone in twice the time?

A   5 hours

B $\frac{1}{3}$hours

C $\frac{4}{5}$hours

D $\frac{2}{3}$hours

Answer: D

Explanation:

Let time taken by Atul, Shiva and Sapan together to finish the work = 'x' hours Time taken by Atul alone to finish the work = (x + 6) years

Time taken by Shiva alone to finish the work = (x + 1) years

Time taken by Sapan alone to finish the work = 2x years

Now,

$$\frac{1}{x+6} + \frac{1}{x+1} + \frac{1}{2x} = \frac{1}{x}$$

$$x = \frac{2}{3}\ hours$$

Question 9

C can empty it in 60 hours .Pipes A and B were Kept open simultaneously for 12 hours . when person reached the tank when it should have been full , he obeserved the pipe c also remained open by mistake for these 12 hours .He immediately closed it . In what time will the tank get full after C is closed

A   3 hours

B   2 hours

C   2.4 hours

D   3.6 hours

Answer: C

Explanation:

Pipes A and B together can fill the tank in 12 hours and C alone can empty the tank in 60 hours.

So, part of tank emptied by pipe C in 12 hours $=\frac{12}{60} = \frac{1}{5}$

Now, this $\frac{1}{5}^{th}$ part of the tank will be filled by pipes A and B together in $\frac{1}{5} \times 12 = 2.4 \; hours$

Question 10

A large water tank gets filled from two pipes and . alone can fill it in 50 minutes, while alone can fill it in one hour. If on any day starts working only after has been used for filling half the tank, then the time taken to fill the tank will be

A $50 + \frac{61}{2}$ minutes

B 110 minutes

C $\frac{1}{2}\left[\frac{1}{50} + \frac{1}{60}\right]$ minutes

D $\frac{150}{11} + 25$ minutes

Answer: D

Explanation:

Time taken by T_1 and T_2 together to fill the tank $= \frac{1}{\frac{1}{50}+\frac{1}{60}} = \frac{300}{11}$ minutes

Time taken by T_1 and T_2 together to fill half the tank $= \frac{300}{2\times11} = \frac{150}{11}$ minutes

Time taken by T_1 alone to fill half the tank $= \frac{50}{2} = 25$ minutes

Total time taken to fill the tank completely = 25 $+\frac{150}{11}$ minutes

Question 11

A tap takes 8 seconds to fill a jar and 6 minutes to fill a.drum. Rahul has to fill the drum with the jar. First he fills the jar and then brings it to the drum and pours the water into the drum. The time taken to bring the jar from the tap to the drum is 10 seconds. Unfortunately, the jar develops a leak, which can empty the full jar in 40 seconds. What will be the minimum total time required by Rahul to fill the drum?

A $18\frac{1}{4}$ minutes

B 18 minutes

C 20 minutes

D $16\frac{2}{3}$ minutes

Answer: C

Explanation:

Let the capacity of Jar and Drum is 8 and 360 respectively.

Quantity of water filled in Jar in 1 second = 1

It takes 40 seconds by the hole to empty the Jar completely.

So. effective time taken to fill the jar = $\frac{1}{\frac{1}{8}-\frac{1}{40}} = 10$ seconds.

It takes 10 seconds to bring the Jar to the drum.

So, quantity of water in Jar emptied in 10 seconds = $8 \times \frac{10}{40} = 2$

Quantity of water poured into Drum by Jar = 6

Total time taken to pour this 6 unit of water = Time taken to fill the Jar + Time taken to bring the Jar to the Drum = 10 + 10 = 20 seconds

Number of time Jar is used to fill the drum = $\frac{Capacity\ of\ drum}{Quantity\ of\ water\ filled\ by\ jar\ in\ one\ go} = \frac{360}{6} = 60\ times.$

Total time taken to fill the drum = 60 × 20 = 1200 seconds = 20 minutes

Question 12

A company manufactures two products X and Y. One unit of X requires three units of material A and two units of material B while one unit of Y requires two units of material A and five units of material B. If 25 units of each product were to be produced, calculate the requirement of material B. If 25 units of each product were to be produced calculate the requirement of material B.

A 175

B 125

C 150

D 156

Answer: A

Explanation:

One unit of X requires two units of material B, then 25 unit of X will require = 2 * 25 = 50 units of material B

One unit of Y requires five units of material B, then 25 unit of Y will require = 5 * 25 = 125 units of material B

Total requirement of material B = 50 + 125 = 175

Question 13

Three containers X, Y and Z have capacities of 10, 20 and 30 litres respectively.

X, which is empty is filled with water from Y.

Y is then filled with the wine from Z.

X is now emptied into Z.

The entire operation is repeated. What would be the strength of wine in the container Z?

A   33%

B   25%

C   51%

D   None of these

Answer: D

Explanation: Table given shows the operations given:

Operations	Containers X (Water: Wine)	Container Y (Water: Wine)	Containers Z (Water: Wine)
Initially	0	Water = 20	30 (Wine)
X is completely filled by Y	Water=10	Water=10	30
Y is completely filled by Z	Water=10	Water=10 Wine=10	20
X is poured into Z	0	Water=10 Wine=10	10:20
X is completely filled by Y	Water=5 Wine=5	Water=5 Wine=5	10:20
Y is completely filled by Z	Water=5 Wine=5	Water=$5+\frac{10}{3}=\frac{25}{3}$ Wine=$5+\frac{20}{3}=\frac{35}{3}$	Water=$10-\frac{10}{3}=\frac{20}{3}$ Wine=$20-\frac{20}{3}=\frac{40}{3}$
X is poured into Z	0	Water=$\frac{25}{3}$ Wine=$\frac{235}{3}$	Water=$\frac{20}{3}+5=\frac{35}{3}$ Wine=$\frac{40}{3}+5=\frac{55}{3}$

Total quantity in container Z $=\frac{35}{3}+\frac{55}{3}=30$

Required percent $=\frac{\frac{55}{3}}{30}\times 100=61\% \ (Approx)$

Question 14

A milk man diluted milk to an extent of 25% of the original volume of pure milk with water and priced it same as the cost price of milk. Part of the water evaporated and the volume was reduced to $\frac{23}{25}$th of the diluted volume. The profit percent to the milk man is

A   23%

B   25%

C   15%

D   20%

Answer: C

Explanation:

Let original quantity of pure milk = 100x

Let cost price of '100x' litres of pure milk = 100

Amount of water added = 25% of 100x = 25x

Total quantity of mixture = 100x + 25x = 125x

Total quantity of mixture after evaporation $=125x\times \frac{23}{25}=115x$

Selling price of '115x' litres of mixture = Cost price of '115x' litres of pure milk = 115x

Profit amount = 115x - 100x = 15x

Profit % $=\frac{15x}{100x}\times 100=15\%$

Question 15

The Percentage volume of alcohol in three solutions M, N, O form a geometric progression in that order. If we mix first , second , third solution in the volume of ratio of 2 : 3 : 4, we obatin a solution containing 32% alchohol . If we mix them in the ratio 3 : 2 : 1 by volume, we obatain a solution containing 22% of alcohol. What is the percentage of Alcohol in M?

A   6%

B   12%

C   18%

D   10%

Answer: B

Explanation:

Let percent of alcohal in mixture M, N and O mixture is 'a', 'ar' and 'a ' respectively.

Now, $\dfrac{2a+3ar+4ar^2}{2+3+4} = 32$

$$a(2 + 3r + 4r^2) = 288 \ldots\ldots..(1)$$

$$\dfrac{3a + 2ar + ar^2}{3 + 2 + 1} = 22$$

$$a(3 + 2r + r^2) = 132 \ldots\ldots.(2)$$

From (1) and (2)

$$\dfrac{a(2 + 3r + 4r^2)}{a(3 + 2r + r^2)} = \dfrac{28824}{13211}$$

$$4r^2 - 3r - 10 = 0$$

$$r = 2 \; From \; equation \; (1):$$

$$a(2 + 6 + 16) = 288$$

a=12

Percentage of alcohol in M=a=12%

Question 16

The content in the beakers A and B are 90 litres of milk and 90 litres of water respectively .Now 30 litres of milk is taken from A and put in to the beaker B after throughly mixing 12 litres of mixure is taken from B and put in to the beaker A.what is the percentage of water in beaker A?

A   14.5%

B   12.5%

C   15.5%

D   17.5

Answer: B

Explanation:

The ratio of milk to water in beaker B after mixing 30 litres of milk from beaker A to beaker

= 30: 90 = 1: 3

The remaining quantity of milk in beaker = 90 - 30 = 60 litres

Quantity of milk in beaker A when 12 litres of mixture from beaker B is mixed in beaker $=60 + 12\frac{1}{4} = 60 + 3 = 63$ litres

Quantity of water in beaker A when 12 litres of mixture from beaker B is mixed in beaker $=12\frac{3}{4} = 9\ l$

Total quantity of mixture in beaker A = 63 + 9 = 72 litres

Required percent $=\frac{9}{72} \times 100 = 12.5\%$

Question 17

Three Friends Kamal , Vishal, Shaan divide ₹1105 amongst them in such a way that ₹10 ,₹20, ₹15 are removed from the sums that kamal,vikhs and shan received respectively ,then the share of the sums that they got will be in the ratio of 11:18:24.How much did shan receive ?

A ₹355

B ₹495

C ₹624

D ₹510

Answer: B

Explanation:

Let amount with Kamal, Vishal and Shaan after removing the amount is '11x', '18x' and '24x' respectively.

Now, Total amount = (11x + 10) + (18x + 20) + (24x + 15) = 1105 53x = 1060 x = 20

Amount received by Shaan = (24x + 15) = Rs.495 Q

uestion 18

At the beginning of a term, the ratio of the number of boys in a school under 15 years to those over 15 years age was 5: 4. At the end of term,the ratio was 7:8 as of 20 boys had reached the age of 15 years during the term. Find the total number of'Boys in the school, given that no boy left or was admitted during the term.

A 225

B 105

C 250

D 215

Answer: A

Explanation:

Let initial number of boys under 15 years and over 15 years are '5x' and '4x' respectively.

Now,

$$\frac{5x - 20}{4x + 20} = \frac{7}{8}$$

40x - 160 = 28x + 140

12x = 300 x = 25

Total boys in the exam = 5x + 4x = 9x = 225

Question 19

Lalit purchased two triangularplots, cach of whichhad exactly two sides of length 100 m. Find the maximum possible difference of the nOoy two plots, if it is knownthat neither of the twoplots is less than 4800 sq. m in area.

A   20 m

B   40 m

C   60 m

D   None of these

Answer: B

Explanation:

Since two sides of triangles are 100 m each.

Now, the third side of triangle must be greater than '0' and less than '200'.

The Minimum length of the third side when the area is greater than or equal to 4800 = 120 m

The maximum length of the third side when the area is greater than or equal to 4800 = 160 m

Now, Difference between perimeter of two triangle = Difference between length of third side = 160 - 120 = 40 m

Question 20

There are two right pyramids with a soni The two pyramids are similar in shape. The height of the first pyramid is 30m and taiof the smaller is 22.5 m. 36 men take 32 days to build the first pyramid. How many dayswould 54 rs of the sameefficiency take to build the second phyramid?

A   20

B   11

C   25

D   9

Answer: D

Explanation:

Since, total work done $\propto$ Volume of pyramids $\propto side^3$

Total work done to built pyramids = Total men working * Days take

Let days taken by 54 men to build the second pyramid = N

Now, $\frac{36 \times 32}{54 \times N} = \frac{30^3}{22.5^3} = \frac{4^3}{3^3}$

N = $\frac{36 \times 32 \times 27}{64 \times 54}$

N= 9 days.

Question 21

Two persons A and B are at two P and Q,respectively. A walks at 'V' km/h and B is 2 km/h faster then A, starting simultaneoausly from where they stand.If they walk towards each other,they meet in 72 minutes.If they walk in the same direction the faster over takes the slower in 6 hours .what are they respective speeds in km/h?

A   3 and 5

B   4 amd 6

C   2 and 4

D   3 and 5

Answer: B

Explanation:

Speed of A = V

Speed of B = V + 2

Let the distance between points P and Q = D

Now,

$$\frac{D}{V + (V + 2)} = \frac{72}{60} = 1.2$$

$$D = 1.2(2V + 2)$$

$$D = 2.4V + 2.4 \dots \dots \dots (1)$$

$$\frac{D}{(V + 2) - V} = 6$$

$$D = 12 \dots \dots \dots (2)$$

From (1) and (2)

12=2.4V+2.4

V=4

Speed of A=V=4 km/hr.

Speed of B = V + 2 = 6 km/h

Question 22

Two trains starting all the same time from two stations 240 km apart and going in opposite directions cross each other at a distance of 160 km from one of the stations. What is the ratio of their speeds?

A   2 : 1

B   2 : 3

C   1 : 3

D   1 : 4

Answer: A

Explanation:

Distance between two stations = 240 km

Their meeting point is 160 km from one of the stations.

So, one train travels 160 km and other train travels 240 - 160 = 80 km.

Since, distance travelled by one train is double of the distance travelled by another train at the same time.

Hence, the ratio of speed will be = 2: 1 or 1: 2

Question 23

It takes eight hours for a 600 km journey, if 120 km is done by train and the rest by car. He takes 20 minutes more, if 200 km is done by the train and the rest by car .The ratio Speed of the train to that of the car is

A   2:3

B   3:2

C   3:4

D   4:3

Answer: C

Explanation:

Let speed of train and car is 'x' and 'y' respectively.

According to the quetsion:

$$\frac{120}{x} + \frac{480}{y} = 8 \dots \dots \dots 1$$

$$\frac{200}{x} + \frac{400}{y} = 8 + \frac{20}{60} = \frac{25}{3} \dots \dots \dots .2$$

From (1) and (2): x = 60 and y = 80

Required ratio = x: y = 60: 80 = 3: 4

Question 24

A person has to cover a distance of 6 km in 45 minutes .If he covers half of the distance in two-third of the total time to cover the remaining distance in the remaining time, his speed must be

A   6 km/h

B   8 km/h

C   12 km/h

D   15 km/h

Answer: C

Explanation: Remaining distance $= \frac{6}{2} = 3$ Km.

Remaining time = $45 \times \frac{1}{3}$ = 15 minutes

Required speed = $\frac{3}{15} \times 60$ = 12 km/h

Question 25

An automobile financier claims to be lending money at simple interest, but he includes the interest every 4 months for calculating the principal, if he is charging an interest of 12%, then the effective rate of interest is approximately

A   13.25%

B   12.5%

C   12.75%

D   13.5%

Answer: B

Explanation: Let principle amount = 1000

SI for first 4 months = $\frac{(1000 \times 12 \times 1)}{100 \times 4}$ = 30

SI for second 4 months = $\frac{1030 \times 12 \times 1}{100 \times 4}$ = 30.9

SI for third 4 months = $\frac{1060.9 \times 12 \times 1}{100 \times 4}$ = 31.827

SI for last 4 months = $\frac{1092.727 \times 12 \times 4}{100 \times 4}$ = 32.78181

Total amount at the end of 1 year = 1092.727 + 32.78181 = 1125.50881

Effective interest = $\frac{1125.50881 - 1000}{10}$ = 12.55% = 12.5% (Approx)

Question 26

A borrowed ₹4800 from B at 9% per annum simple interest for 3 years. He then added some more money to the borrowed sum and lent it to C for the same period at 12% per annum simple interest. If A gains ₹720 in the whole transaction, how much money did he add from his side?

A ₹500

B ₹740

C ₹640

D ₹800

Answer: D

Explanation:

Total amount of interest given by A to B = $\frac{4800 \times 9 \times 3}{100}$ = Rs.1296

Let extra amount added by A = X

Total amount of interest received by A to C = $\frac{(4800 + X) \times 12 \times 3}{100}$ = (1728 + 0.36X)

Now, (1728 + 0.36X) - 1296 = 720

0.36X = 288

X = 800

Hence, extra amount added = Rs.800

Question 27

If the rate of interest be 5% per annum for first year, 89 % per annum for second year and 12% percent per annum for third year, then the compound interest of ₹ 8000 for 3 years will be

A ₹2055.16

B ₹1480.24

C ₹2160.64

D   ₹1350.36

.Answer: C

Explanation:

Total amount of interest at the end of 3 years = 8000 × 1.05 × 1.08 × 1.12 - 8000

= 10160.64 - 8000 = Rs.2160.64

Question 28

A man borrows ₹5000 from a bank at 8% per annum compound interest. At the end of every year, he pays ₹1000 as a part payment of loan and-interest. How much does he still owe to the bank after three such installments?

A   ₹3052.16

B   ₹3442.20

C   ₹3616.84

D   ₹3824.40

Answer: A

Explanation: Total amount left at the end of 1 year = $5000 + \frac{500 \times 8 \times 1}{100} - 1000$ = Rs.4400

Total amount left at the end of 2 year = $4400 + \frac{4400 \times 8 \times 1}{100} - 1000$ = Rs.3752

Total amount left at the end of 3 year = $3752 + \frac{3752 \times 8 \times 1}{100} - 1000$ = Rs.3052.16

Question 29

A solid cylinder of lead 8 m and 2 m radius is melted and recast into a cone of radius 1.5 m. What is the height of the cone?

A   16.67 m

B   21.35 m

C   42.67 m

D   31.35 m

Answer: C

Explanation:

Let the height of cone = 'h' cm

Volume of cylinder = Volume of cone

$\pi \times 2^2 \times 8 = \frac{1}{3} \times \pi \times 1.5^2 \times h$

$3 \times 4 \times 8 = 1.5 \times 1.5 \times h$

$h = 42.67$ m

Question 30

A repost consists of 20 sheets ethof 55 lines and each suchline consists of 65 characters. This report is reduced onto sheetseach of 65 lines such that each line consists: of 70 characters. The percentage reduction in numberofsheetsis closer to

A   20%

B   5%

C   30%

D   35%

Answer: A

Explanation:

Total character in 20 sheets of 55 lines each = $20 \times 55 \times 65$

Let the number of sheets after reductio = N

According to the question:

$20 \times 55 \times 65 = N \times 65 \times 70$

N = $\frac{110}{7} = 15.7\ pages = 16\ pages$

Reduction in number of sheets = 20 - 16 = 4 pages

Required percent = $\frac{4}{20} \times 100 = 20\%$

Question 31

Out of the total production of iron from hematite, an ore of Iron, 20% of the ore gets wasted, and out of the remaming iron, only 25% is pure iron. If the pure iron obtained if a year from a mine of hematite Was 80,000 kg then the quantity of hematite mined from that mine in the year is?

A   500000 kg

B   400000 kg

C   450000 kg

D   400500 kg

Answer: B

Explanation:

Let the quantity of hematite mined from the mine in a year = 100x

Wasted ore = 20% of 100x = 20x

Pure iron = 25% of (100x - 20x) = 20x = 80000

x = 4000

Hence, quantity of hematite mined from the mine in a year = 100x = 400000 kg

Question 32

An express train without its rake can go 24 km an hour, and the speed is diminished by a quantity that varies as the square root of the number wagons attached .If it is known that it is four wagons its speed is 20 km/hthe greatest number of wagons with which the engine can just move is

A   143

B   140

C   135

D   210

Answer: A

Explanation: Speed of train without wagons = 24 km/h

Reduction in speed with 'n' wagons $\propto \sqrt{n}$

Reduction in speed with 'n' wagons $= k\sqrt{n}$

Speed of train with 4 wagons = 20 = $24 - k\sqrt{4}$

2k = 4

k = 2

Now,

Consider the case when the speed of train is zero.

$$24 - 2\sqrt{n} = 0$$

$$24 = 2\sqrt{n}$$

$$12 = \sqrt{n}$$

$$12^2 = n => n = 144$$

Hence, total number of wagons will be 143 when the train can just move.

Question 33

They are six boxes are numbered 1, 2, 3, 4, 5, 6. Each box is to be filled with either red or green balls in such a way that at least one box containing green balls are consecutively numbered .The total number of days in which these can be done is

A   60

B   33

C   21

D   5

Answer: C

Explanation:

Case 1: Total ways when one box contains one green ball = {1}. {2}, {3}, {4}, {5}, {6} = 6 ways

Case 2: Total ways when two boxes contain one green ball = {1, 2}, {2, 3}, {3, 4}, {4, 5}, {5, 6} = 5 ways

Case 3: Total ways when three boxes contain one green ball = {1, 2, 3}, {2, 3, 4}, {3, 4, 5}, {4, 5, 6} = 4 ways

Case 4: Total ways when four boxes contain one green ball = {1, 2, 3, 4}, {2, 3, 4, 5}, {3, 4, 5, 6} = 3 ways

Case 5: Total ways when five boxes contain one green ball = {1, 2, 3, 4, 5}, {2, 3, 4, 5, 6} = 2 ways

Case 6: Total ways when all the six boxes contain one green ball = {1, 2, 3, 4, 5, 6} = 1 way

Total ways = 6 + 5 + 4 + 3 + 2 + 1 = 21

Question 34

'N' persons stand on the circumference of a circle at distinct points. Each possible pair of persons, not standing next to cach other, sings a two-minute song one pair after the other. If the total time taken for singingis 28 minutes, what is 'N'?

A   5

B   7

C   9

D

None of these

Answer: B

Explanation:

Since, N persons are standing on the circumference of a circle at distinct points and each possible pair of persons, not standing next to each other, sings a two-minute song one pair after the other.

Total time taken is 28 minutes when each pair sings for 2 minutes, then total time taken will be 14 minutes when each pair sings for 1 minute.

A person standing can't form pair with himself and with his two neighbors.

Hence, total possible pairs = N * (N - 3).

This also includes the pair in both clockwise and anticlockwise direction.

Hence, the actual number of pair = $\frac{N(N-3)}{2} = 14$

N(N - 3)=28

N = 7

Question 35

Thirty six identical chairs must be arranged in rows with the same ntimber of chairs in each row. Each row must contain at least three chairs and there must beat least three rows. A row 1S parallel to the front of the room. How many different angementsare possible?

A   2

B   4

C   5

D   6

Answer: C

Explanation:

Case 1: When there is 3 chairs in each row, then total rows = $\frac{36}{3} = 12$ (Valid)

Case 2: When there is 4 chairs in each row, then total rows = $\frac{36}{4} = 9$ (Valid)

Case 3: When there is 6 chairs in each row, then total rows = $\frac{36}{6} = 6$ (Valid)

Case 4: When there is 9 chairs in each row, then total rows = $\frac{36}{9} = 4$ (Valid)

Case 5: When there is 12 chairs in each row, then total rows = $\frac{36}{12} = 3$ (Valid)

Hence, total possible arrangements = 5

Question 36

In an examination, A obtains 10 percent less than the minimum number of marks required for passing. B obtains 11 percent less than A. C obtains 41 percent less than the number of marks obtained by A and B together. Does C pass the exam or fail?

A   Pass

B   Fail

C   Cannot be determined

D   None of these

Answer: A

Explanation:

Let passing marks in the exam = 90

Marks obtained by A = 90% of 90 = 81

Marks obtained by B = $\left(100 - 11\frac{1}{9}\right)$ % of 81 = 72

Marks obtained by A and B together = 81 + 72 = 153

Marks obtained by C = $\left(100 - 41\frac{3}{17}\right)$ % of 153= 90

Hence, C will pass the exam

Question 77 From a well shuffled pack of 52 cards, 3 cafds'are drawn successively, the first being replaced before the second is drawn and the second being replaced before the third is drawn. The probability that the first is black, the sec m isdiamond andthethirdis ace. is

A $\frac{1}{104}$

B $\frac{1}{52}$

C $\frac{1}{26}$

D $\frac{1}{13}$

Answer: A

Explanation:

Since, three cards are drawn successively after replacing the previous one.

Probability of drawing first card which is Black = $\frac{26C_1}{52C_1} = \frac{26}{52} = \frac{1}{2}$

Probability of drawing second card which is Diamond = $\frac{13C_1}{52C_1} = \frac{13}{52} = \frac{1}{4}$

Probability of drawing third card which is Ace= $\frac{4C_1}{52C_1} = \frac{4}{52} = \frac{1}{13}$

Required probability = $\frac{1}{2} \times \frac{1}{4} \times \frac{1}{13} = \frac{1}{104}$

Question 38

In a class, there are equal number of boys and girls. Two students are selected for a game.If the probabilty that the two students are girls is ,then what is the strength of the class?

A   15

B   30

C 90

D 60

Answer: B

Explanation:

Let boys and girls in the class are 'x' each.

Total students = x + x = 2x

Probability of selecting two girls from the class = $$\frac{xC1}{2xC1} = \frac{7/29}$$ $$\frac{[x(x - 1)]}{[2x(x - 1)]} = \frac{7}{29}$$

29(x - 1) = 14(2x - 1)

29x - 29 = 28x - 14

x =15

Strength of class = 2x = 30

Question 39

Two squares of sizé $$1\times1$$ are selected one after another from an $$8\times8$$ chessboard. The 'probability that the two squares belong to different rows and different columns, is

A $$\frac{1}{6}$$

B $$\frac{5}{36}$$

C $$\frac{29}{36}$$

D $$\frac{7}{9}$$

Answer: D

Explanation:

First we'll select 1 square out of total 64 squares that means we can't select second square from that row and that column.

Now we're left with 7 rows and 7 columns from which we can select another square.

Hence, total square left = 7 * 7 = 49 [From which we can select another square].

Probability to select first square = $$\frac{64C1}{64C1} = 1$$

Probability to select first square = $$\frac{49C1}{63C1} = \frac{49}{63}$$

Required probability = $$1 * \frac{49}{63}$$ $$= \frac{7}{9}$$

Question 40

Virat was asked to multiply a two-digit number P by a three-digit number Q. But she mistakenly multiplied P by the number formed by writing the digits of Q in the reverse order, there by getting an answer which is 22770 more than the correct answer. What is the minimum possible sum of the digits of Q?

A   8

B   7

C   6

D   can not be determined

Answer: E