AAU UAT CENTER

Numerical reasoning practices

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Choose the best answer for each of the following

1) Average of five numbers is 20. If each number is multiplied by 2, what will be the new average?

A. 30
B. 40
C. 50
D. 60

Answer : **B**

- **Explanation:** The new average = Initial average $*$ 2= 20 $*$ 2 = 40

2) A group consists of two male, two female and three children. The average age of the male is 67 years, that of the female is 35 years, and that of the children is six years. What is the average age of the group?

A. 30.71
B. 31.71
C. 28.71
D. 35.45

Answer: B

Explanation: Average = (67*2+35*2+6*3)/7
= (134+70+18) /7
= 222 /7
= 31.71

3) The captain of a cricket team of 11 members is 26 years old, and the wicket-keeper is three years older than the captain. If the ages of captain and wicketkeeper are excluded, the average age of the remaining players of the team is one year less than the average age of the whole team. What is the average age of the team?

A. 19
B. 49
C. 17
D. 23

Answer: D

Explanation:
Let the average age of the whole team by x years. 11x - (26 + 29) = 9(x -1)
11x - 55 = 9x -9
11x - 9x = - 9 + 55
2x = 46
x = 23 Years.

4) A museum has an average of 510 visitors on Sunday and 240 on other days. Find the average number of visitors per day in a month of 30 days beginning with a Sunday.

A. 285
B. 275
C. 237
D. 245

Answer: A

Explanation: Since, the month begins with a Sunday, so there will be 5 Sundays and 25 other days in this month.
So, the average no. of visitor per day

$$\frac{510*5+240*25}{30}$$

= 285

5) If the number of quantities in group A is 10 and in group B is 8, and their individual average is 24 and 16 respectively, find the combined average of the two groups.

A. 20.44
B. 18.22
C. 16.22
D. 18.66

Answer: A

Explanation:
The combined average of the two groups is =

$$\frac{No.of\ quantities\ in\ Gp.A * Average\ of\ Gp.A\ +\ No.of\ quantities\ \ in\ Gp.B * Average\ of\ Gp.B}{No.of\ quantities\ in\ Gp.A\ +\ Number\ of\ quantities\ in\ Gp.B}$$

=(10*24+8*16)/(10+8)
= (240+128)/18
= 368/18
= 20.44

6) Find the average of cubes of first 7 consecutive natural numbers.

A. 112
B. 110
C. 116
D. 113

Answer: A

Explanation:
The average of cubes of first n consecutive natural numbers is given by;
$= n (n+1)^2/4$
Here, n=7
$= 7 (7+1)^2/4$
$= 7*64/4$
$=448/4$
$= 112$

7) The average weight of a group of 5 boys is 26. If we replace a boy of weight 25 in the group with another boy so that new average increases by 3, find the weight of the new body.

A. 56
B. 34
C. 40
D. 33

Answer: C

Explanation:
The weight of new person = Weight of the removed person + No. of persons * Increase in average.
= 25+5*3
=25+15
= 40

8) 7X2 is a three digit number and X is the missing digit. If the number is divisible by 6, the missing digit is

A. 4

B. 3

C. 2

D. 5

Answer :B

- **explanation:** The given number is divisible by 6 so it would be divisible by 2 and

3. As the last digit is 2 whatever be the value of X, it would be divisible by 2.

Now, 7+X+2 = 9 + X, must be divisible by 3.

∴X = 3 makes the number divisible by 3, so 3 is the required digit.

9) If $(2^p + 1)$ is a prime number, which one of the following digits could be the value of p?

A. 3

B. 4

C. 5

D. 6

Answer :B

Explanation: In such questions, each alternative should be tried. So,

if P = 3, we will get; 8 + 1= 9

If P = 4, we will get; 16 + 1 = 17

If P = 5, we will get; 32 + 1 = 33

If P= 6, we will get; 64 + 1= 65

Out of the four results, only 17 is the prime number. So, the required value of the P is 4.

10) A boy was asked to multiply a number by 25 but by mistake he multiplied by 45 and the answer was 200 more than the correct answer. What was the number?

A.7

B. 8

C.10

D.12

Answer: C

Explanation:

$$\text{The required number} = \frac{\text{Increase in result}}{\text{Wrong multiplier} - \text{correct multiplier}}$$

$$= \frac{200}{45-25} = 10$$

11) If two-third of three-fourth of a number is 34, find the 20% of that number?

A. 13

B. 13.6

C. 14

D. 14.6

Answer : B

Explanation: Let the number is X. As per question;

$$\frac{\frac{2}{3}*3}{4}*X=34$$

$$\frac{6}{12} * X = 34$$

$$X = \frac{12*34}{6} = 68$$

Now, 20% of 68 = 68 * $\frac{20}{100}$ = 13.6

12) . Find the value of √(8√(8√(8√(8√(8√(8√(8….. n.

A. 4

B. 2

C. √64

D. 8

Answer: D

- **Solution:** In case of same type of root values multiplication, the number itself will be the answer i.e., the number is 8.
- Hence, the answer is 8.

13). (1-1/2)(1-1/3)(1-1/4) (1-1/x) = ?

A. x

B. x-1

C. 1/ (x-1)

D. 1/x

Answer: D

Explanation: This type of question can solve by a sort trick that is the first term numerator, and the last term denominator will be the answer.
i.e., 1-1/2 = 1/2, 1-1/3 = 2/3, 1-1/4 = 3/4
and so on (1/2)*(2/3)*(3/4) ((x-1)/x) =
(1) (1/x)
The first term denominator cancelled by its next term numerator till the end. In the end, we get 1/x.

14).Find the number which is completely divisible by 45.

A.306990

B.331145

C. 256987

D.181660

Answer: A

- **Explanation:** A number, which is divisible by 3, 5, and 9, is also divisible by 45. A number is divisible by 3 if the sum of its entire digits is divisible by 3.
- A number is divisible by 9 if the sum of its entire digits is divisible by 9. The number which ends with 0 or 5 is divisible by 5.
- The number 306990 fulfils all the requirements, so the answer is 306990.

15) On a certain sum of money the compound interest Rs. 318 is earned in 2 years. If the rate of interest is 12%, what is the principal amount?

a. Rs. 1250
b. Rs.1300
c. Rs. 1200
d. Rs. 1150

Answer : A

Explanation:

We have;

C.I. = Rs.

318 r =

12%

t = 2 years

Apply formula: $C.I = P\left[\left(1+\frac{r}{100}\right)^{t} - 1\right]$

$318 = P\left[\left(1+\frac{12}{100}\right)^{2} - 1\right]$

$318 = P\left[\frac{112}{100} * \frac{112}{100} - 1\right]$

$318 = P * 0.2544$

$P = \frac{318}{0.2544}$ = Rs.1250 (Option A)

16) If the difference between Simple Interest and Compound Interest on a sum of money for 3 years is 200 and the rate of interest is 10%, what is the sum?

a. 6451.6
b. 6351.6
c. 6251.6
d. 6151.6

Answer: A

Explanation: If the difference between C.I. and S.I. on a certain sum for 3 years at rate of interest r% is Rs. X, then the sum is given by;

Sum = $\frac{X * (100)3}{r2\ (300 + r)}$

We have;

X = Rs.

200 r =

10%

Therefore, sum is:

$= \frac{200 * 100 * 100 * 100}{10 * 10 * 310}$

$= \frac{2000000}{310}$ = Rs. 6451.6 (Option A)

17) A's and B's shares in a business are in the ratio of 5:3. If A has invested 70000 birr for 12 months, for what period B has invested birr. 60000?

a. 7 months
b. 7.4 months
c. 8 months
d. 8.4 months

Answer:D

Explanation:

A's capital be C1 = 70000 B's capital be C2 = 60000 A's time be T1= 12 months

Let B's time be T2 = X months A's share: B's share = 5:3 Apply

$$\frac{\text{Profit of A}}{\text{Profit of B}} = \frac{C1*T1}{C2*T2}$$

formula:

$$\frac{5}{3} = \frac{C1*T1}{C2*T2}$$

$$\frac{5}{3} = \frac{70000*12}{60000*X}$$

300000 X = 2520000

$X = \frac{252}{30} = 8.4$ months

18) X and Y enter into a partnership for a year. X invests Rs. 6000, and Y invests Rs. 8000. After 4 months, they admit Z, who invests Rs. 9000. If Y withdraws his contribution after 6 months, how would they share a profit of Rs 1000 at the end of the year?

a. 350, 300, 350
b. 375, 250, 375
c. 400, 300, 300
d. 100, 600,300

Answer: B

Explanation:

X's capital be C1 = 6000 Y's capital be C2 = 8000 Z's capital be C3 = 9000 X's time be T1 = 12 months Y's time be T2 = 6 months Z's time be T3 = 8 months Profit = 1000

The profit will be divided in the ratio:-

(C1 * T1): (C2 * T2): (C3 * T3) (6000*12): (8000*6): (9000*8) i.e., 72000: 48000: 72000
Or, 72:48:72
Divide the whole equation by 24. The ratio will be 3: 2: 3
Sum of the ratios will be 3+2+3= 8

Apply formula:

X's share = (X's ratio/ sum of all three ratios)* total profit Hence, X's share is (3/8) * 10000 = 375
X's and Z's share are equal in ratio, so Z's share =375 Y's share = 1000 - (A + B)'s share
= 1000 - 750 = 250

19) The age of Amanuel 10 years ago was thrice the age of his son. After ten years, Amans age will be twice that of his son. What is the ratio of their present ages?

a. 7:3
b. 3:7
c. 9:4
d. 4:9

Answer: A

Explanation:
Let the age of son 10 years ago = x
years Then age of Aman = 3x
According to
question After 10
years 2(x+20) =
3x+20
2x + 40 = 3x +
20 X= 20
The present of son and Aman are x+10 and 3x+ 10
respectively Son's age = 20+10 = 30 years
Aman age = 3 ×20 + 10 = 60+10 = 70
years Ratio of their present age is
=70:30 =7:3

20) A man can row a boat at a speed of 20 km/hr in still water. If the speed of the stream is 5 km/hr, in what time he can row a distance of 75 km downstream?

a. 1.5 hours
b. 2 hours
c. 2.5 hours
d. 3 hours

Answer : D

Explanation: Speed of boat = 20 km/hr Speed of

stream = 5 km/hr

∴ Speed downstream = 20 + 5= 25 km/hr

Required Time = $\frac{\text{Distance}}{\text{Speed}} = \frac{75}{25}$ = 3 hours

21) A boat travels upstream from Q to P and downstream from P to Q in 3 hours. If the distance between P to Q is 4km and the speed of the stream is 1kmph, then what is the velocity of the boat in still water?

a. 3kmph
b. 4kmph
c. 5kmph
d. 7.2kmph

Answer: A

Explanation: Let the velocity or speed of the boat in still water is x km/hr. And the Speed of the stream = 1km/hr

So, the speed of the boat along the stream = (x+1) km/hr.
The speed of the boat against the stream = (x-1) km/hr.

Note: time = Distance / Speed

So, [4/ (x+1)] + [4/ (x-1)] = 3 hrs.

Note: go through the given options to get the answer quickly or solve the equation as follows:

Or, [4 (x+1+x-1)]/ [(x+1) (x-1)] = 3
Or, 8x = 3(x2-12)
Or, 8x = 3x2-3
Or, 3x2-8x-3=0
Or, 3x2- 9x+ x-3 = 0
Or, (x-3) (3x+1) = 0
Therefore x=3 or, x=-1/3 (speed can't be -ve)
Hence, the speed or velocity of the boat in still water is 3 km/hr.

22) How many times the hands of a clock coincide in a day?

a. 24
b. 22
c. 23
d. 21

ANSWER :B

Explanation: The hands of a clock coincide only once between 11 O' clock and 1 O' clock, so in every 12 hours, the hands of a clock will coincide for 11 times.

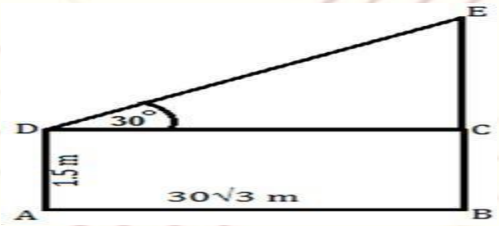
∴ In a day or 24 hours, the hands of a clock will coincide for 22 (11+11) times.

23) A man 1.5 meter tall is $30\sqrt{3}$ meter away from a building. When he sees the top of building the angle of elevation is 30°. Find the height of the building?

a. 31.5m
b. 30 m
c. 53.4m
d. 48 m

Answer : A

Explanation:



Let AD be the man and BE the building.

Now draw a line DC so that DC is

perpendicular to BE. Now, BC = AD = 1.5 m

And, DC = AB = $30\sqrt{3}$ m

$$\frac{EC}{DC}\left(\frac{Perpendicular}{Base}\right) = \tan 30° \left(\frac{1}{\sqrt{3}}\right)$$

$$\frac{EC}{30\sqrt{3}} = \frac{1}{\sqrt{3}}$$

$$EC = \frac{30\sqrt{3}}{\sqrt{3}} = 30 \text{ m}$$

Now, Height of building, BE = BC + EC

= 1.5 + 30 = 31.5 m

24) An exam comprises 80 questions carrying one mark each,Parvez answers 65% of the first 40 questions correctly. How much percent of the remaining 40 questions does he need to answer correctly to score 75% in this exam?

a. 80%
b. 85%
c. 73%
d. 40%

Answer: b

Explanation: Total marks =
80 65% of 40 = (65/100) * 40
= 26
And, 75% of 80 = (75/100) * 80 = 60
i.e., the required marks 60-26 = 34
So, he needs to answer 34 questions correctly out of the remaining 40 questions. The required percentage = 34/40 * 100 = 85%

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25) Three pipes A, B and C can fill a cistern in 8 minutes,12 minutes and 16 minutes respectively. What is the time taken by three pipes to fill the cistern when they are opened together?

A. 3.7 minutes

B. 4 minutes

C. 4.5 minutes

D. 5 minutes

Answer :A

Explanation: Part of the tank filled by A in one minute = $\frac{1}{8}$ Part

of the tank filled by B in one minute = $\frac{1}{12}$

Part of the tank filled by C in one minute = $\frac{1}{16}$

Net part of the tank filled by A+B+C in one minute;

$= \frac{1}{8} + \frac{1}{12} + \frac{1}{16}$

$\frac{6+4+3}{48} = \frac{13}{48}$

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$\frac{13}{48}$ Part of the cistern is filled in one minute.

$\therefore$ The whole tank will be filled in $\frac{48}{13}$ = 3.7 minutes

26) A cylindrical tank of diameter 25 cm is full of water. If 11 litres of water is drawn off, the water level in the tank will drop by (use π =22/7).

A. $10\frac{1}{2}$cm

B. $12\frac{6}{7}$cm

C. 14 cm

D. $22\frac{2}{5}$ cm

The correct answer is D.

Answer with explanation:

Volume of cylinder = $\pi r^2 h$

$\pi r^2 h$ = 11 litres = 11000 cm^3

Or $\frac{22}{7} * \frac{25}{2} * \frac{25}{2}$ = 11000 cm^3

h = $\frac{11000 * 7 * 2 * 2}{22 * 25 * 25}$

h = $\frac{28*4}{5} = \frac{112}{5}$ = $22\frac{2}{5}$cm

Therefore, the water level in the will be drop by 222/5 cm

27) Natinael bought 30 kg of rice at the rate of 9.50birr/ kg and 40 kg rice at the rate of 8.50birr /kg and mixed them. He sold the mixture at the rate of 8.90birr /kg. Find his total profit or loss in the transaction.

A. Birr 2 loss
B. Birr 5 profit
C. Birr 2 profit
D. bir 7

loss **Answer:**

A

Explanation:

The total cost price = 30* 9.5 + 40* 8.5 =
625 The total selling price = 8.9(30+40)
= 623

- **cost price> selling price = Loss**
- Hence, the total loss in this transaction
- = 625-623
- = 2 Loss

28) A running man crosses a bridge of length 500 meters in 4 minutes. At what speed he is running?

A. 8.5 km/hr
B. 7.5 km/hr
C. 9.5 km/hr
D. 6.5 km/hr

Answer :B

Explanation:

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

- Distance = 500 meters
- Time = 4 minutes ⟶ 4 x 60 = 240

seconds Speed = $^{500}\!/_{240} = {}^{25}\!/_{12}$ m/s

We need answer in km/hr:

Speed in km/hr = $^{25}\!/_{12} * {}^{18}\!/_{5} = {}^{90}\!/_{12} \longrightarrow {}^{30}\!/_{4}$ = 7.5 km/hr

29) A can finish a work in 8 hours, B can finish the same work in 12 hours, and C can do it in 24 hours. All the three starts work at 3 am, 4 am, and 5 am respectively. At what time work will be completed?

A. 6 am
B. 7: 40 am
C. 8 am
D. 5 am

Answer: B

Note: Assume the total work = LCM of the given time

Take the LCM of hours = LCM of (8, 12, and 24) = 24 Let the total work = 24

Note: One hour work = (total work/ time) Now,

A's one hour work = 24/8 = 3
unit B's one hour work = 24/12 = 2 unit C's one hour work = 24/24= 1 unit

ATQ, between 3 am - 4 am, A works alone and finish 3 units of work Between 4 am - 5 am, A and B work and complete 3+2 = 5 units of work Between 5 am - 6 am, A, B, and C works and finishes 3+2+1 = 6 units of work

Or, between 3 am to 5 am, 8 unit of work is finished.
Remaining 24-8= 16 unit (till 5am)
After 5 am, A+B+C work together and finish 6 unit of work

per hours. i.e., 6 unit work = 1 hour

To complete the 16 unit work, multiply both sides with 2

i.e., 12 unit work = 2 hours
Remaining work = 16-12 = 4 unit work

As we know, 6 work = 1 hour Or, 1 work = 1/6 hours
Or, 4 work = 4/6 or 2/3 hours.

That means (2 + 2/3) hours requires after 5 am.

So, time taken to complete the work is (5 +2 + 2/3) = 7:40am

30) A 20 liter mixture contains 30% alcohol and 70% water. If 5 liters of water is added to the mixture, what will be the percentage of alcohol in the new mixture ?

A. 22%

B. 23%

C. 24%

D. 25%

ANSWER :C

Explanation:

Initially, the mixture contains 30% alcohol = $\frac{30}{100} * 20 = 6$ liters of alcohol

And, 70% of water = $\frac{70}{100} * 20 = 14$ liters of water

After adding 5 liters of water, the mixture contains (14+5) 19 liters of water and 6 liters of alcohol.

$\therefore$ Percentage of alcohol = $\frac{6}{25} * 100 = 24\%$



THE END