1. What value will come in place of question mark in the following equations 0.006 ÷ ? = 0.6? **[Pubali Officer 23]**

A. 0.01 B. 0.001 C. 0.002 D. 0.0001 **Ans: A**

Explanation:

Let, the required number be x.

0.006 ÷ x = 0.6

Or, 0.6x = 0.006

$\therefore x = \frac{0.006}{0.6} = \frac{6\times10}{6\times1000} = \frac{1}{100} = 0.01$**(Ans.)**

2. The product of two numbers is 4107. If the H.C.F of these numbers is 37, then the greater number is: **[Janata AEO Teller 15, Pubali Officer 23]**

A. 101 B. 107 C. 111 D. 185 **Ans: C**

Explanation:

Let, the numbers be 37x and 37y. (Because HCF is 37)

So, LCM = 37xy

We know,

LCM×HCF = The product of two numbers

Or, 37xy×37 = 4107 $\therefore xy = \frac{4107}{37\times37} = 3$

Co-prime with product 3 is (3,1) [**Note**: LCM = HCF× Prime number]

The numbers are (37×3) = 111 and (37×1) = 37.

∴ The greater number = 111 (**Ans.**)

3. 48.95 – 32.006 =? **[Pubali Officer 23]**

A. 16.089 B. 16.35 C. 16.89 D. 16.944 **Ans: D**

Explanation:

∴ 48.95 – 32.006 = 16.944**(Ans.)**

4. What is the square root of 0.16? **[Pubali SO 23, Pubali Officer 23]**

A. 0.004 B. 0.04 C. 0.4 D. 4 **Ans: C**

Explanation:

$\sqrt{0.16} = \sqrt{(0.4)^2} = 0.4$ **(Ans.)**

5. 7589 - ? = 3434 **[Pubali Officer 23]**

A. 4242 B. 4155 C. 1123 D. 11023 **Ans: B**

Explanation:

∴ 7589 – 3434 = 4155**(Ans.)**

6. The smallest 3 digit prime number is: **[Pubali Officer 23]**

A. 103 B. 107 C. 109 D. None of these **Ans: D**

Explanation:

∴ 101 is the smallest 3 digit prime number.

7. If (a - b) is 6 more than (c + d) and (a + b) is 3 less than (c - d), than (a - c) is: **[Pubali Officer 23]**

A. 0.5 B. 1.5 C. 1 D. None of these **Ans: B**

Explanation:

1st condition, 2nd condition,

a – b = c + d + 6 ……(i) a + b = c – d – 3 ……(ii)

(i) + (ii)=>

2a = 2c + 3

Or, 2a – 2c = 3 Or, 2(a - c) = 3 $\therefore a - c = \frac{3}{2} = 1.5$ **(Ans.)**

8. The difference of the squares of two consecutive odd integers is divisible by which of the following integers? **[Pubali Officer 23]**

A. 3 B. 6 C. 7 D. 8 **Ans: D**

Explanation:

Let, the two consecutive odd integers be (2x+3) and (2x+1)

As per question,

$(2x+3)^2 - (2x+1)^2 = (4x^2 + 12x + 9) - (4x^2 + 4x + 1) = 4x^2 + 12x + 9 - 4x^2 - 4x - 1 = 8x + 8 = 8(x + 1)$

∴ The difference is divisible by 8.**(Ans.)**

9. $3640 \div 14\times16 + 340 = ?$ [Pubali Officer 23]

A. 0.70 B. 3525 C. 4480 D. None of these **Ans: D**

Explanation:

$\therefore 3640 \div 14\times16 + 340 = 260\times16 + 340 = 4160 + 340 = 4500$(**Ans.**)

10. If 4(A's capital) = 6(B's capital) = 10(C's capital), then out of a profit of Tk. 4650, C will receive: [BB Cash 16, Pubali Officer 23]

A. 900 B. 1550 C. 2250 D. 465 **Ans: A**

Explanation:

Given that, $4A = 6B = 10C$

$4A = 10C \quad \therefore A = \frac{10C}{4} = \frac{5C}{2}$

and $6B = 10C \quad \therefore B = \frac{10C}{6} = \frac{5C}{3}$

$\therefore A: B: C = \frac{5C}{2}: \frac{5C}{3}: C = \frac{5}{2}: \frac{5}{3}: 1 = 15: 10: 6$ [Multiplying by 6]

$\therefore$ C's profit = Tk. $(4650\times\frac{6}{15+10+6})$ = Tk. 900 (**Ans.**)

11. Find the average of all the numbers between 6 and 34 which are divisible by 5. [Pubali Officer 23]

A. 18 B. 20 C. 24 D. 30 **Ans: B**

Explanation:

$\therefore$ Average $= \frac{10+15+20+25+30}{5} = 20$ (**Ans.**)

12. A is 30% more efficient than B. How much time will they, working together, take to complete a job which A alone could have done in 23 days? [Combined 4 Banks Officer 19, PKB EO Cash 18, BB AD 16, Pubali Officer 23]

A. 13 days B. 11 days C. $20\frac{3}{17}$ days D. None of these **Ans: A**

Explanation:

A can do in 23 days. So, B can do in 130% of $23 = \frac{130}{100}\times23 = \frac{299}{10}$ days

In 1 day, A and B can do $= \frac{1}{23} + \frac{10}{299} = \frac{13+10}{299} = \frac{23}{299} = \frac{1}{13}$ part.

$\therefore$ A and B can do in 13 days. (**Ans.**)

13. The average runs of a cricket player of 10 innings was 32. How many runs must he make in his next innings to increase his average of runs by 4? [Combined 5 Banks Cash 22 (2019 based), Pubali Officer 23]

A. 76 B. 70 C. 4 D. 2 **Ans: A**

Explanation:

Total runs in 10 innings $= 10\times32 = 320$

Total runs in 11 innings $= 11\times(32+4) = 396$

$\therefore$ Runs in 11^{th} innings $= 396 - 320 = 76$(**Ans.**)

14. The difference between a number and its three fifth is 50. What is the number? [Pubali Officer 23]

A. 75 B. 100 C. 125 D. None of these **Ans: C**

Explanation:

Let, the number be x.

As per question,

$x - \frac{3x}{5} = 50$

Or, $\frac{5x-3x}{5} = 50$ Or, $2x = 250$ $\therefore x = \frac{250}{2} = 125$

$\therefore$ The number = 125. (**Ans.**)

15. What percent is 3% of 5%? [Pubali Officer 23]

A. 15% B. 30% C. 50% D. 60% **Ans: A**

Explanation:

Let, the required percentage be x.

As per question,

x% = 3% of 5%

Or, $\frac{x}{100} = 3\%\times\frac{5}{100}$

$\therefore x = 15\%$ (**Ans.**)

16. By selling a pen for Tk. 15, a man loses one- sixteenth of what it costs him. The cost price the pen is: [Pubali Officer 23]

A. Tk. 16 B. Tk. 18 C. Tk. 20 D. Tk. 21 **Ans: A**

Explanation:

Let, cost price be Tk. 16x. So, loss = $\frac{x}{16}$ of 16x = Tk. x

As per question,

16x – x = 15

Or, 15x = 15 Or, x = $\frac{15}{15}$ = 1 ∴ 16x = 1×16 = 16

∴ Cost price = Tk. 16. (**Ans.**)

17. Two-fifth of one-third of three-seventh of a number is 15. What is 40 percent of that number? [Pubali Officer 23]

A. 72 B. 84 C. 136 D. None of these **Ans: D**

Explanation:

Let, the number be x

As per question,

$\frac{2}{5}\times\frac{1}{3}\times\frac{3}{7}$ of x = 15

Or, $\frac{2x}{35}$ = 15 Or, x = 15×$\frac{35}{2}$

∴ 40% of x = $\frac{40}{100}\times15\times\frac{35}{2}$ = 105(**Ans.**)

18. A sum of money is to be distributed among A, B, C, D in the proportion of 5: 2: 4: 3. If C gets Tk. 1000 more than D, what is B's share? [Rupali SO 13, Pubali Officer 23]

A. Tk.500 B. Tk. 1500 C. Tk. 2000 D. None of these **Ans: C**

Explanation:

Let, the A, B, C and D get Tk. 5x, Tk. 2x, Tk. 4x and Tk. 3x respectively.

As per question,

4x -3x = Tk. 1000

Or, x = Tk. 1000 ∴ 2x = Tk. (2×1000) = Tk. 2000

∴ B's share = Tk. 2000 (**Ans.**)

19. 3 pumps, working 8 hours a day, can empty a tank in 2 days. How many hours a day must 4 pumps work to empty the tank in 1 day? [BB Cash 16, [Pubali Officer 23]

A. 10 B. 11 C. 12 D. 9 **Ans: C**

Explanation:

In 2 days, 3 pumps can empty a tank by working 8 hours a day

∴ In 1 day, 1 pump can empty a tank by working 8×2×3 hours a day

∴ In 1 day, 4 pumps can empty a tank by working $\frac{8\times2\times3}{4}$ = 12 hours a day(**Ans.**)

20. Ten years ago, A was half of B in age. If the ratio of their present age is 3:4, what will be the total of their present ages? [Rupali SO 13, Rupali SO 19, Pubali Officer 23]

A. 20 years B. 30 years C. 45 years D. None of these **Ans: D**

Explanation:

1st condition,

A -10 = $\frac{1}{2}$(B-10) Or, 2A -20 = B-10 ∴ B = 2A-10

2nd condition,

A: B = 3:4 Or, $\frac{A}{2A-10}=\frac{3}{4}$

Or, 6A -30 = 4A Or, 6A -4A = 30 Or, 2A = 30 ∴ A = 15

∴ B = 2×15-10 = 30-10 = 20

∴ A+ B = 15+ 20 = 35 years (**Ans.**)

Alternative method:

Let, 10 years ago A's age be x years and B's age be 2x years.

Present age of A = (x +10) years and age of B = (2x +10) years

As per question,

(x+10): (2x+10) = 3: 4

Or, 6x + 30 = 4x +40 Or, 6x -4x = 40-30 Or, 2x = 10 ∴ x = 5

∴ Total present age of A and B = x +10 + 2x+10 = 3x +20 = 3×5+20 = 35 years. (**Ans.**)

21. If 2A = 3B = 4C, then, A: B: C is. [Pubali Officer 23]

A. 2: 3: 4 B. 4: 3: 2 C. 6: 4: 3 D. 20: 15: 2 **Ans: C**

Explanation:

Given that, 2A = 3B = 4C

$B = \frac{2A}{3}$ and $C = \frac{2A}{4} = \frac{A}{2}$

$\therefore$ A: B: C = A: $\frac{2A}{3}$: $\frac{A}{2}$ = 1: $\frac{2}{3}$: $\frac{1}{2}$ = 6: 4: 3 (**Ans.**)

22. $(1000)^7 \div 10^{18}$ = ? [Pubali Officer 23]

A. 10 B. 100 C. 1000 D. 10000 **Ans: C**

Explanation:

$\therefore (1000)^7 \div 10^{18} = (10)^{7\times3} \div 10^{18} = (10)^{21} \div 10^{18} = 10^{21-18} = 10^3 = 1000$ (**Ans.**)

23. The greatest number which can divide 1356, 1868 and 2764, leaving the same reminder 12 in each case, is: [Pubali Officer 23]

A. 64 B. 124 C. 156 D. 260 **Ans: A**

Explanation:

The required number will be HCF of (1356-12) = 1344, (1868-12) = 1856 and (2764 - 12) = 2752

1344)1856(1
1344
512)1344(2
1024
320)512(1
320
192)320(1
192
128)192(1
128
64)128(2
128
0

64)2752(43
256
192
192
0

$\therefore$ The greatest number which can divide 1356, 1868 and 2764 leaving the same remainder 12 in each case is 64.(**Ans.**)

24. An article when sold at a gain of 5% yields Tk. 15 more than when sold at a loss of 5%. Its cost price would be- [Combined 3 Banks SO 18, PKB EO Cash 18, BB AD 14, Pubali SO 23]

অনুবাদঃ

একটি পণ্য ৫% ক্ষতির পরিবর্তে ৫% লাভে বিক্রি করলে ১৫ টাকা বেশি পাওয়া যেত।পণ্যটির ক্রয়মূল্য কত?

A. Tk. 100 B. Tk. 150 C. Tk. 200 D. Tk. 250 **Ans: B**

Explanation:

Let, cost price be Tk. 100x

At 5% profit, selling price = 105% of 100x = Tk. 105x

At 5% loss, selling price = 95% of 100x = Tk. 95x

$\therefore$ Price difference = Tk. (105x-95x) = Tk. 10x

As per question,

10x = Tk. 15

$\therefore$ 100x = Tk. $\frac{15}{10}\times100$ = Tk. 150 (**Ans.**)

Shortcut:

এখানে ৫% ক্ষতি ও ৫% লাভের মাঝে শর্তকরা পার্থক্য ১০%

ATQ,

10% = Tk. 15

$\therefore$ 100% = Tk. $\frac{15}{10}\times100$ = Tk. 150(**Ans.**)

Alternative Method:

As per question,

5% + 5% = Tk. 15

$\therefore$ 1% = Tk. $\frac{15}{10}$

$\therefore$ 100% = Tk. $\frac{15}{10}\times100$ = Tk. 150(**Ans.**)

25. A person crosses a 600m long street in 5 minutes. What is his speed in km per hour?[Janata AEO 15, Janata RC 17, Pubali JO 19, Premier TJO 20, Pubali SO 23]

A. 3.6 B. 7.2 C. 8.4 D. 10 **Ans: B**

Explanation:

$\therefore$ Speed = $\frac{Distance}{Time} = \frac{600m}{5\times60s}$ = 2 m/s = $2\times\frac{18}{5}$ km/h = 7.2 km/h (**Ans.**)

26. The sum of two numbers is 184. If one-third of the one exceeds one-seventh of the other by 8, find the smaller number. [Pubali Officer 23]

A. 65 B. 72 C. 76 D. 80 **Ans: C**

Explanation:

Let, one number be x. So, other number = 184-x.

As per question,

$\frac{x}{3} - \frac{184-x}{7} = 8$

Or, $\frac{7x-552+3x}{21} = 8$

Or, 10x -552 = 168 Or, 10x = 168 + 552 = 720 $\therefore x = \frac{720}{10} = 72$

$\therefore$ The smaller number = 72. (**Ans.**)

27. A takes twice as much time as B or thrice as much time as C to finish a piece of work. Work together, they can finish the work in 2 days. B can do the work alone in: [BB Cash 16, Pubali SO 23]

A. 6 days B. 8 days C. 12 days D. 4 days **Ans: A**

Explanation:

Let, B can do the work alone in 3x days.

A can do the work alone in = 2×3x = 6x days and C can do the work alone in = 2x days.

As per question,

$\frac{1}{6x} + \frac{1}{3x} + \frac{1}{2x} = \frac{1}{2}$

Or, $\frac{1+2+3}{6x} = \frac{1}{2}$ Or, $\frac{1}{x} = \frac{1}{2}$ Or, x = 2 $\therefore$ 3x = 3×2 = 6(**Ans.**)

28. 0.01 is what percent of 0.1? [Rupali SO 13, BB AD 14, Pubali SO 23]

A. $\frac{1}{100}$ B. $\frac{1}{10}$ C. 10 D. 100 **Ans: C**

Explanation:

Let, the number be x

As per question,

x% of 0.1 = 0.01 Or, $\frac{x}{100} \times \frac{1}{10} = \frac{1}{100}$ $\therefore$ x = 10 (**Ans.**)

29. If a number x is 10% less than another number y and y is 10% more than 125, then x is equal to: [Pubali SO 23]

A.123.75 B. 140.55 C. 143 D. 150 **Ans: A**

Explanation:

1st condition,

y = 125 + 10% of 125 = 125 + 12.5 = 137.5

2nd condition,

x = 90% of y = $\frac{90}{100} \times 137.5 = \frac{9}{10} \times 137.5 = \frac{1237.5}{10}$ = 123.75 (**Ans.**)

30. 7 is added to a certain number; the sum is multiplied by 5; the product is divided by 9 and 3 is subtracted from the quotient. The reminder left is 12. The number is: [Pubali Officer 23]

A. 20 B. 30 C. 40 D. 60 **Ans: A**

Explanation:

Let, the number be x.

As per question,

$\frac{5(x+7)}{9} - 3 = 12$

Or, $\frac{5(x+7)}{9} = 3 + 12 = 15$

Or, 5x + 35 = 135 Or, 5x = 135-35 = 100 $\therefore$ x = 20

$\therefore$ The number = 20 (**Ans.**)

31. A sells an article which costs him Tk. 400 to B at a profit of 20%. B then sells it to C, making a profit of 10% on the price he paid to A. How much does C pay to B? [Pubali SO 23]

A. Tk. 472 B. Tk. 476 C. Tk. 528 D. Tk. 532 **Ans: C**

Explanation:

B's cost price = 120% of Tk. 400 = Tk. 480. [A's SP = B's CP]

Selling at 10% profit, C's cost price = 110% of Tk. 480 = Tk. 528 [C's CP = B's SP]

$\therefore$ C pays to B = Tk. 528 (**Ans.**)

32. In a camp, there is a meal for 120 men or 200 children. If 150 children have taken the meal, how many men will be catered to with the remaining meal? [Janata AEO Teller 15, Pubali SO 23]

A. 20 B. 30 C. 40 D. 50 **Ans: B**

Explanation:

200 children = 120 men ∴ 50 children = $\frac{120}{200}\times 50 = 30$ men

২০০ জন চিল্ড্রেনের মধ্যে ১৫০ জন খাবার খাওয়ার পর বাকি ৫০ জন চিল্ড্রেনের খাবার দিয়ে 30 men খেতে পারবে।

33. Two number are in the ratio 3: 5. If 9 is subtracted from each, the new numbers are in the ratio 12: 23. The smaller number is [Combined 8 Banks SO 19, Pubali SO 23]

A. 27 B. 33 C. 49 D. 55 **Ans: B**

Explanation:

Let, the number be 3x and 5x

As per question,

$\frac{3x-9}{5x-9} = \frac{12}{23}$

Or, 69x -207 = 60x -108

Or, 69x -60x = 207-108 Or, 9x = 99 Or, x = 11

∴ 3x = 11×3 = 33(**Ans.**)

34. Reena and Shaloo are partners in a business. Reena invests Tk. 35000 for 8 months and Shaloo invests Tk. 42000 for 10 months. Out of a profit of Tk. 31570, Reena's Share is: [Uttara PO 17, Pubali SO 23]

A. Tk. 9,471 B. Tk. 12,628 C. Tk. 18,040 D. Tk. 18,942 **Ans: B**

Explanation:

Reena: Shaloo = (35000×8): (42000×10) = 2: 3

∴ Reena's share = Tk. ($31570\times\frac{2}{5}$) = Tk. 12628(**Ans.**)

35. If 50% of (x -y) = 30% of (x + y), then what percent of x is y? [Pubali SO 23]

A. 25 B. 30 C. 35 D. 40 **Ans: A**

Explanation:

50% of (x -y) = 30% of (x + y)

Or, $\frac{50}{100}$(x-y) = $\frac{30}{100}$(x +y)

Or, $\frac{1}{2}$(x-y) = $\frac{3}{10}$(x +y)

Or, 10(x-y) = 6(x +y) Or, 10x -10y = 6x + 6y

Or, 10x -6x = 6y +10y Or, 4x = 16y Or, 16y = 4x

∴ y = $\frac{4x}{16} = \frac{x}{4} = \frac{x}{4}\times 100\% = 25\%$ of x (**Ans.**)

36. The smallest number added to 680621 to make the sum a perfect square is: [Pubali SO 23]

A. 4 B. 5 C. 6 D. 8 **Ans: A**

Explanation: বর্গমূল করতে হবে

```
680621 | 824
  64
162 | 406 |
      324
1644 | 8221 |
       6576
       1647
```

∴ $(824)^2 < 680621 < (825)^2$

∴ The required number to be added = $(825)^2 - 680621 = 680625 - 680621 = 4$ (**Ans.**)

37. The average of 20 numbers is zero. Of them, at the most(বড় জোর), how many be greater than zero? [Janata AEO 15, Pubali SO 23]

A. 0 B. 1 C. 10 D. 19 **Ans: D**

Explanation:

২০ টি সংখ্যার গড় শূন্য। প্রশ্নে জানতে চাওয়া হয়েছে যে, ২০ টি সংখ্যার মধ্যে বড় জোর কতটি সংখ্যা শুন্য থেকে বড় হতে পারে? ২০ টি সংখ্যার মধ্যে বড় জোর ১৯ টি সংখ্যা শুন্য থেকে বড় হতে পারে কারণ ১৯ টি সংখ্যার যোগফল যদি (+x) হয় এবং ২০ তম সংখ্যার মান (-x) হয় তাহলে ২০ টি সংখ্যার গড় শুন্য হবে। অনুরূপভাবে, Average of 10 numbers is zero. At most, how many numbers may be greater than zero? উত্তর ৯টি হবে।

38. A number is doubled and 9 is added. If the resultant(প্রাপ্ত ফলাফল) is trebled, it becomes 75. What is the number? [Rupali SO 13, Pubali SO 23]

A. 3.5 B. 6 C. 8 D. None of these **Ans: C**

Explanation:

Let, the number be x

As per question,

$3(2x+9) = 75$

Or, $6x+ 27 = 75$ Or, $6x = 75-27= 48$ $\therefore x = 8$

$\therefore$ The number = 8 (**Ans.**)

39. The product of two numbers is 2028 and their H.C.F. is 13. The number of such pairs is: [Pubali SO 23]

A. 1 B. 2 C. 3 D. 4 **Ans: B**

Explanation:

Let, the numbers be 13x and 13y. (Because HCF is 13)

So, LCM = 13xy

We know,

LCM×HCF = The product of two numbers

Or, $13xy\times13 = 2028$ $\therefore xy = \frac{2028}{13\times13} = 12$

Co-prime with product 12 are (3,4) and (1, 12) [**Note**: LCM = HCF× Prime number]

The numbers are $(13\times3) = 39$ and $(13\times4) = 52$ Or, $(13\times1) = 13$ and $(13\times12) = 156$.

$\therefore$ The number of pair = 2 (**Ans.**)

40. A positive number, when decreased by 4 is equal to 21 times the reciprocal of the number. The number is? [Pubali SO 23]

A. 3 B. 5 C. 7 D. 9 **Ans: C**

Explanation:

Let, the number be x.

As per question,

$(x-4) = 21\times\frac{1}{x}$

Or, $x^2 -4x -21 = 0$

Or, $x^2 -7x+3x -21 = 0$

Or, $x(x -7) +3(x -7) = 0$ Or, $(x-7)(x +3) = 0$ $\therefore x = 7$

$\therefore$ The number is 7(**Ans.**)

41. At present, the ratio between the ages of Karim and Rahim is 4: 3. After 6 years, Karim's age will be 26 years. What is the age of Rahim at present? [Pubali SO 23]

A. 12 years B. 15 years C. $19\frac{1}{2}$ years D. 21 years **Ans: B**

Explanation:

Let, the present age of Karim be 4x years and Rahim be 3x years.

As per question,

$4x +6 = 26$

Or, $4x = 26- 6 = 20$

Or, $x = \frac{20}{4} = 5$

$\therefore 3x= 3\times5 = 15$ years

$\therefore$ The age of Rahim at present = 15 years. (**Ans.**)

42. The least number by which 294 must be multiplied to make it a perfect square, is: [Rupali SO 13, Pubali SO 23]

A. 2 B. 3 C. 6 D.24 **Ans: C**

Explanation:

2 | 294

3 | 147 $\therefore 294 = 2\times3\times7\times7$; অর্থাৎ ২× ৩ = ৬ দ্বারা গুণ করলে পূর্ণবর্গ সংখ্যা হবে।

7 | 49

7

43. The value of 1001 ÷ 11 of 13 is: [BB AD 14, Pubali SO 23]

A. 7 B. 91 C. 143 D. 169 **Ans: A**

Explanation:

1001 ÷ 11 of 13 = 1001 ÷ 143 = 7(**Ans.**)

44. The sum of first five prime numbers is: [Janata EO(Afternoon) 17, Pubali SO 23]
A. 11 B. 18 C. 26 D. 28 **Ans: D**
Explanation:
2+ 3 +5 + 7+ 11 = 28 (**Ans.**)

45. The difference between the local value and the face value of 7 in the numeral 32675149 is- [Pubali SO & O 16, Pubali SO 23]
A. 75142 B. 69993 C. 64851 D. 5149 **Ans: B**
Explanation:
Place value of 7 = 70000 and face value of 7 = 7
∴ Difference = 70000 -7 = 69993(**Ans.**)

46. What decimal of an hour is a second? [BB AD 16, Pubali SO 23]
A. 0.0025 B. 0.0256 C. 0.00027 D. 0.000126 **Ans: C**
Explanation:
1 hour = 3600 seconds ∴ 1 second = $\frac{1}{3600}$ hour = 0.00027 (**Ans.**)

47. Find the highest common factor of 36 and 84. [Pubali SO 23, Pubali JO 23]
A. 6 B. 12 C. 18 D. 24 **Ans: B**
Explanation:
নির্ণেয় বৃহত্তম সংখ্যাটি ৩৬ ও ৮৪ এর গ.সা.গু হবে।
36)84(2
72
12)36(3
36
0
∴ নির্ণেয় বৃহত্তম সংখ্যা = ১২(**Ans.**)

48. What the least number must be added to 1056, so that the sum is completely divisible by 23? [Pubali SO 23]
A. 2 B. 3 C. 18 D. 21 **Ans: A**
Explanation:
23 | 1056 | 4
92
136
115
21 (Remainder)
∴ The least number should be added = (23- 21) = 2(**Ans.**)

49. 8597 - ? = 7429 – 4358. [Pubali JO 23]
A. 5426 B. 5706 C. 5526 D. 5476 **Ans: C**
Explanation:
Let, the required number be x.
As per question,
8597 - x = 7429 – 4358
Or, 8597 - x = 3071
∴ x = 8597-3071 = 5526 (**Ans.**)

50. 0.014×0.014 = ? [Pubali JO 23]
A. 0.000196 B. 0.00196 C. 19.6 D. 196 **Ans: A**
Explanation:
$0.014\times0.014 = (0.014)^2 = 0.000196$ (**Ans.**)
Tricks: দশমিক সংখ্যার বর্গ করার ক্ষেত্রে দশমিকের পরে যে কয়টি অংক থাকবে তা বর্গ করার পর দ্বিগুণ সংখ্যক অংক হবে। এখানে দশমিকের পরে ৩টি অংক তাই বর্গ করলে ৬টি অংক হবে। ১৪ এর বর্গ করলে ১৯৬ হয় যা ৩ অংক তাই বাকি ৩টি অংক দশমিকের পরে শুন্য দিয়ে পুরণ করে ৬ অংক করতে হবে = ০.০০০১৯৬।

51. 100×10 -100 + 2000 ÷100 = ? [Pubali JO 23]
A. 29 B. 780 C. 920 D. 979 **Ans: C**
Explanation:
100×10 -100 + 2000 ÷100 = 100×10 -100 + 20 = 1000- 100 + 20 = 920 (**Ans.**)

52. $49\times49\times49\times49 = 7^{?}$ [Pubali TA Teller 17, [Pubali SO 23]
A. 4 B. 7 C. 8 D. 16 **Ans: C**
Explanation:
$49\times49\times49\times49 = 7^{?}$
Or, $7^2\times7^2\times7^2\times7^2 = 7^{?}$ Or, $7^{2+2+2+2} = 7^{?}$ Or, $7^8 = 7^{?}$ ∴ ? = 8(**Ans.**)

53. $(17)^{3.5}\times(17)^{?} = 17^8$ [Pubali JO 23]
A. 2.29 B. 2.75 C. 4.25 D. 4.5 **Ans: D**
Explanation:
$(17)^{3.5}\times(17)^{?} = 17^8$
Or, $(17)^{3.5+?} = 17^8$
Or, $3.5 + ? = 8$ ∴ $? = 8 - 3.5 = 4.5$ (**Ans.**)

54. The ratio of two numbers is 3: 4 and their H.C.F is 4. Their L.C.M is: [BB AD 16, Pubali JO 23]
A. 12 B. 16 C. 24 D. 48 **Ans: D**
Explanation:
∴ LCM = Product of the ratios× HCF = 3×4×4 = 48 (**Ans.**)

55. 666÷ 6 ÷3 =? [Pubali JO 23]
A. 37 B. 333 C. 111 D. 84 **Ans: A**
Explanation:
∴ 666÷ 6 ÷3 = 111÷3 = 37(**Ans.**)

56. 12.1212 + 17.0005 – 9.1102 = ? [Pubali JO 23]
A. 20.0015 B. 20.0105 C. 20.0115 D. 20.1015 **Ans: C**
Explanation:
∴ 12.1212 + 17.0005 – 9.1102 = 29.1217 – 9.1102 = 20.0115 (**Ans.**)

57. If 2 table and 3 chairs cost Tk. 3500 and 3 tables and 2 chairs cost Tk. 4000, then how much does a table cost? [Pubali JO 23]
অনুবাদঃ
যদি ২টি টেবিল এবং ৩টি চেয়ারের মূল্য ৩,৫০০ টাকা এবং ৩টি টেবিল ও ২টি চেয়ারের মূল্য ৪০০০ টাকা হয় তাহলে একটি টেবিলের মূল্য কত?
A. 500 B. 750 C. 1000 D. 15000 **Ans: C**
Explanation:
Let, the cost of a table and a chair be Tk. x and Tk. y respectively.
According to the question,
$2x + 3y = 3500$ ...(i)
$3x + 2y = 4000$ .....(ii)
Now, (ii)×3-(i)×2=>
$9x-4x = 12000-7000$ Or, $5x = 5000$ ∴ $x = 1000$
∴ A table costs = Tk. 1000. (**Ans.**)

58. The square root of $(272^2 - 128^2)$ is: [Pubali JO 23]
A. 144 B. 200 C. 240 D. 256 **Ans: C**
Explanation:
$\sqrt{(272^3 - 128^2)} = \sqrt{(272+128)(272-128)} = \sqrt{400\times144} = 20\times12 = 240$(**Ans.**)

59. The square root of $(7+3\sqrt{5})(7-3\sqrt{5})$ is: [Janata EO(Morning) 17, Pubali JO 23]
A. $\sqrt{5}$ B. 4 C. 2 D. $3\sqrt{5}$ **Ans: C**
Explanation:
$\sqrt{(7+3\sqrt{5})(7-3\sqrt{5})} = \sqrt{(7)^2 - (3\sqrt{5})^2} = \sqrt{49-45} = \sqrt{4} = 2$(**Ans.**)

60. The average of 50 numbers is 30. If two numbers, 35 and 40 are discarded, then the average of the remaining number is nearly. [Pubali JO 23]
A. 28.32 B. 28.78 C. 29.27 D. 29.68 **Ans: C**
Explanation:
Total of 50 numbers = 50×30 = 1500 Total of 48 numbers = 1500-35-40 = 1425
∴ Average of 48 numbers = $\frac{1425}{48}$ = 26.68 (**Ans.**)

61. If one-third of one-fourth of a number is 15 then three- tenth of that number is: [Rupali Officer 13, Pubali JO 23]

A. 35 B. 36 C. 45 D. 54 **Ans: D**

Explanation:

Let, the number be x.

$\frac{1}{3}$ of $\frac{1}{4}$ of x = 15 Or, x = 180

$\therefore \frac{3}{10}$ of x = $\frac{3}{10}$ of 180 = 54 (**Ans.**)

62. The sum of two numbers is 22. Five times one number is equal to 6 times the other. The bigger is of the two numbers is: [BDBL Officer 14, Pubali JO 23]

A. 10 B. 12 C. 15 D. 16 **Ans: B**

Explanation:

Let, one number be x and other be 22-x

As per question,

5x = 6(22-x)

Or, 5x = 132-6x Or, 5x + 6x = 132 Or, 11x = 132 $\therefore$ x = 12

$\therefore$ The bigger number = 12(**Ans.**)

63. Eighteen years ago, a father was three times as old as his son. Now, the father is only twice as old as his son. Then the sum of the present ages of the son and the father is: [Pubali JO 23]

A. 54 B. 72 C. 105 D. 108 **Ans: D**

Explanation:

Let, the present age of father be x years and son be y years.

1st condition,

x = 2y …..(i)

2nd condition,

x – 18 = 3(y – 18)

Or, 2y – 18 = 3y – 54 [From equation (i)]

Or, 3y – 2y = 54 -18

$\therefore$ y = 36

Putting the value of y in equation (i)

$\therefore$ x = 2×36 = 72

$\therefore$ Sum of their present ages = x + y = 72 + 36 = 108 (**Ans.**)

64. 88% of 370 + 24% of 210 - ? = 118. What stands for question mark? [Pubali JO 23]

A. 256 B. 258 C. 268 D. 358 **Ans: B**

Explanation:

Let, the required number be x.

88% of 370 + 24% of 210 - x = 118

Or, 325.6 + 50.4 -118 = x

Or, 376 -118 = x

$\therefore$ x = 258 (**Ans.**)

65. The sale price of an article including the sales tax is Tk. 616. The rate of sales tax 10% If the shopkeeper has made a profit of 12%, then the cost price of the article is: [Pubali JO/JO(cash) 14, Janata AEO 15, Pubali JO 23]

A. Tk. 500 B. Tk. 515 C. Tk. 550 D. Tk. 600 **Ans: A**

Explanation:

Including tax, selling price = Tk. 616

$\therefore$ At excluding 10% tax, selling price = Tk. $\frac{616}{110\%}$ = Tk. 560

$\therefore$ At 12% profit, cost price = Tk. $\frac{560}{112\%}$ = Tk. 500 (**Ans.**)

66. 36 men can complete a piece of work in 18 days. In how many days will 27 men complete the same work? [Pubali SO & O 14, Pubali JO 23]

A. 12 B. 18 C. 22 D. 24 **Ans: D**

Explanation:

36 men can do in 18 days

$\therefore$ 1 man can do in 18×36 days

$\therefore$ 27 men can do in $\frac{18\times36}{27}$ = 24 days. (**Ans.**)

67. The length of a rectangular hall is 5m more than its breadth. The area of the hall is 750m^2. The length of the hall is: [Janata AEO Teller 15, Pubali JO 23]

A. 15m B. 22.5m C. 25m D. 30m **Ans: D**

Explanation:

Let, breadth be x m. So, length = (x+5) m

As per question,

x(x+5) = 750

Or, $x^2 + 5x - 750 = 0$ Or, $x^2 + 30x - 25x - 750 = 0$

Or, x(x+30)-25(x+30) = 0 Or, (x+30)(x-25) = 0 ∴ x = 25 [x≠ -30]

∴ Length = (25+ 5) m = 30 m (**Ans.**)

68. A and B invest in a business in the ratio 3: 2. If 5% of the total profit goes to charity and A's share is Tk. 855. The total profit is- [Combined 5 Banks Cash 19, PKB EO Cash 19, Pubali JO 23]

A. Tk. 1425.00 B. Tk. 1537.50 C. TK. 1576.00 D. TK. 1500.00 **Ans: D**

Explanation:

Profit will be given according to the investment ratio.

Given that, Investment ratio of A and B is 3: 2

Let, A's profit be Tk. 3x and B's profit be Tk. 2x.

So, total profit = Tk. (3x +2x) = Tk. 5x

Here, 5% of profit goes to charity.

According to the question,

95% of 3x = 855

Or, $\frac{95}{100}\times 3x = 855$ Or, $3x = \frac{855\times 100}{95}$ Or, $5x = \frac{855\times 100\times 5}{95\times 3}$ ∴ 5x = 1500

∴ Total profit = Tk. 1500. (**Ans.**)

69. A works twice as fast as B. If B can complete a work in 12 days independently, the number of days in which A and B can together finish the work is: [Pubali JO 23]

A. 4 days B. 6 days C. 8 days D. 18 days **Ans: A**

Explanation:

Given that, B can complete in 12 days. So, A can complete twice fast in 6 days.

In 1 day, A and B together can complete = $\frac{1}{12}+\frac{1}{6}=\frac{1+2}{12}=\frac{3}{12}=\frac{1}{4}$ part of the work

∴ A and B can together finish the work in 4 days. (**Ans.**)

70. A train 240 m long passed a pole in 24 seconds. How long will it take to pass a platform 650 m long? [Janata AEO 15, BDBL SO 17, HBFC SO 17, BB AD 18, Uttara PO 21, GIBL PO 21, Combined 9 Banks SO 23, Pubali JO 23]

A. 65 sec B. 89 sec C. 100 sec D. 130 sec **Ans: B**

Explanation:

মোট দৈর্ঘ্য = ট্রেন + প্লাটফর্ম = 240 + 650 = 890 মিটার

ট্রেনটি 240 মিটার অতিক্রম করে 24 সেকেন্ডে

" 1 " " " $\frac{24}{240}$ "

" 890 " " " $\frac{24\times 890}{240}$ = 89 সেকেন্ডে (**Ans.**)

Speed of the train = $\frac{240\text{m}}{24\text{s}}$ = 10 m/s

Total distance = 240+650 = 890 m

Time taken to pass the platform

= $\frac{\text{Distance}}{\text{Speed}}=\frac{890}{10}$ = 89 seconds.

71. In how many years, Tk. 150 will produce the same interest @ 8% as Tk. 800 produce in 3 years @ $4\frac{1}{2}$%? [Pubali JO 23]

অনুবাদঃ

৪.৫% সরল মুনাফায় ৮০০ টাকায় ৩ বছরে যে মুনাফা হয়, কত বছরে ৮% সরল মুনাফায় ১৫০ টাকা সেই মুনাফা অর্জন করবে?

A. 6 B. 8 C. 9 D. 12 **Ans: C**

Explanation:

Given that, P = Tk. 800, r = 4.5%, n = 3 years.

We know,

I = Pnr = 800×3×4.5% = Tk. 108

Again, P = Tk. 150, I = Tk. 108, r = 8% = $\frac{8}{100}$.

We know,

I = Pnr

Or, $108 = \frac{150\times n\times 8}{100}$ ∴ $n = \frac{108\times 100}{150\times 8} = 9$

Ans: 9 years.

72. The profit earned by selling an article for Tk. 900 is double the loss incurred when the same article is sold for Tk. 450. At what price should the article be sold to make 25% profit? [BB AD 23]

A. Tk. 750 B. Tk. 800 C. Tk. 600 D. Data independence **Ans: A**

Explanation:

Let, the cost price be Tk. x.

As per question,

900-x = 2(x -450)

Or, 900 –x = 2x – 900

Or, 2x + x = 900 + 900 Or, 3x = 1800 $\therefore x = \frac{1800}{3} = 600$

∴ Cost price = Tk. 600.

∴ At 25% profit, selling price = 125% of Tk. 600 = Tk. $\frac{125\times600}{100}$ = Tk. 750. (**Ans.**)

73. A man purchases two clocks A and B at a total cost of Tk. 650. He sells A at 20% profit and B at a loss of 25% and gets the same selling price for both the clocks. What are the purchasing prices of A and B respectively? [BB AD 23]

A. 225, 425 B. 275, 375 C. 300, 350 D. 250, 400 **Ans: D**

Explanation:

Let, the purchase price of two clocks be Tk. x and Tk. 650-x respectively.

120% of x = 75% of (650-x)

Or, $\frac{120x}{100} = \frac{75}{100}(650-x)$

Or, $\frac{6x}{5} = \frac{3}{4}(650-x)$ Or, 24x = 15(650-x) Or, 24x = 9750 – 15x

Or, 24x + 15x = 9750 Or, 39x = 9750 $\therefore x = \frac{9750}{39} = 250$

∴ The purchase price of A = Tk. 250 and price of B = Tk. (650-250) = Tk. 400 (**Ans.**)

74. Fresh grapes contain 80% water, while dry grapes contain 10% water. If the weight of dry grapes is 250 kg, then what was its total weight, when it was fresh? [BB AD 23]

A. 1000 kg B. 11000 kg C. 1125 kg D. 125 kg **Ans: C**

Explanation:

Water in dry grapes = 10% of 250 = 25 kg. So, pulp = 250-25 = 225 kg

Given that, in fresh grapes 80% water and 20% pulp.

As per question,

20% = 225

$\therefore 1\% = \frac{225}{20}$

$\therefore 100\% = \frac{225\times100}{20} = 1125$

∴ Total weight of fresh grapes = 1125 kg(**Ans.**)

75. When 30% of one number is subtracted from another number, the second number is reduced to its four-fifths. What is the ratio of the first number to the second number? [BB AD 23]

A. 3: 2 B. 2: 3 C. 2: 5 D. 4: 7 **Ans: B**

Explanation:

Let, the first number be x and the second number be y.

As per question,

$y - 30\% \text{ of } x = \frac{4}{5} \text{ of } y$

Or, $y - \frac{30x}{100} = \frac{4y}{5}$ Or, $y - \frac{4y}{5} = \frac{30x}{100}$ Or, $\frac{5y-4y}{5} = \frac{3x}{10}$

Or, $\frac{y}{5} = \frac{3x}{10}$ Or, 15x = 10y Or, $\frac{x}{y} = \frac{10}{15} = \frac{2}{3}$

∴ x: y = 2: 3 (**Ans:**)

76. Tk. 6000 becomes Tk. 7200 in 4 years at a certain rate of simple interest. If the rate becomes 1.5 times of itself, the amount of the same principal in 5 years will be- [BB AD 23]

A. Tk. 8000 B. Tk. 8250 C. Tk. 9000 D. 9250 **Ans: B**

Explanation:

Let, principle = Tk. 6000; interest = Tk. (7200-6000) = Tk. 1200, time = 4 years

$\therefore r = \frac{100I}{Pn} = \frac{100\times1200}{6000\times4} = 5$

∴ Rate of interest = 5%.

∴ New interest rate = 1.5×5 = 7.5%

∴ Amount = P + Pnr = 6000+ 6000×5×7.5% = 6000 +6000×5×$\frac{7.5}{100}$ = 6000+ 2250 = Tk. 8250(**Ans.**)

77. P and Q are two positive integers such that PQ = 64. Which of the following is not the correct value of P + Q? [BB AD 23]

A. 16 B. 20 C. 35 D. 65 **Ans: C**

Explanation:

2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2

∴ Possible pair = (64, 1), (32, 2), (16, 4), (8, 8)

∴ By adding possible pair only 35 could not get. So, 35 is not the correct value of P + Q.

78. Find the largest number of five digits which, when divided by 16, 24, 30 or 36 leaves the same reminder 10 each case- [BB AD 23]

A. 99370 B. 99360 C. 99350 D. 99340 **Ans: A**

Explanation:

১৬, ২৪, ৩০ এবং ৩৬ এর ল.সা.গু = ৭২০ এবং ৫ অঙ্কের বৃহত্তম সংখ্যা = ৯৯৯৯৯

৭২০ | ৯৯৯৯৯ | ১৩৮

৭২০
২৭৯৯
২১৬০
৬৩৯৯
৫৭৬০
৬৩৯(ভাগশেষ)

৯৯৯৯৯ কে ৭২০ দিয়ে ভাগ করলে ৬৩৯ অবশিষ্ট থাকে অর্থাৎ ৯৯৯৯৯ এর সাথে ৬৩৯ বিয়োগ করে বিয়োগফলের সাথে ১০ যোগ করলে ৫ অঙ্কের নির্ণেয় বৃহত্তম সংখ্যাটি পাওয়া যাবে।

∴ নির্ণেয় সংখ্যাটি হবে = (৯৯৯৯৯- ৬৩৯)+ ১০ = ৯৯৩৭০(**Ans.**)

79. One third of Arun's marks in Mathematics exceeds a half of his marks in English by 30. If he got 240 marks in the two subjects together, how many marks did he get in English? [BB AD 23]

A. 180 B. 120 C. 90 D. 60 **Ans: D**

Explanation:

Let, marks in English be x. So, marks in Mathematics = 240 –x

As per question,

$\frac{240-x}{3} - \frac{x}{2} = 30$

Or, $\frac{480-2x-3x}{6} = 30$

Or, 480 – 5x = 180 Or, 480 – 180 = 5x

Or, 5x = 300 ∴ x = $\frac{300}{5} = 60$

∴ Arun got 60 marks in English. (**Ans.**)

80. If $\frac{x}{2x+y+z} = \frac{y}{x+2y+z} = \frac{z}{x+y+2z} = a$, then find the value of 'a' if $(x + y + z) \neq 0$. [BB AD 23]

A. $\frac{1}{2}$ B. $\frac{1}{3}$ C. $\frac{1}{4}$ D. $\frac{1}{8}$ **Ans: C**

Explanation:

Given that,

$\frac{x}{2x+y+z} = \frac{y}{x+2y+z} = \frac{z}{x+y+2z} = a$

Now,

$\frac{x}{2x+y+z} = a$ ∴ x = a(2x +y +z) …….. (i)

$\frac{y}{x+2y+z} = a$ ∴ y = a(x +2y +z) ……..(ii)

$\frac{z}{x+y+2z} = a$ ∴ z = a(x +y +2z) ……..(iii)

(i) + (ii)+ (iii)=>

x + y + z = a(2x +y +z) + a(x +2y +z) + a(x +y +2z)

Or, $x + y + z = a(2x + y + z + x + 2y + z + x + y + 2z)$
Or, $x + y + z = a(4x + 4y + 4z)$
Or, $4a(x + y + z) = x + y + z$
$\therefore a = \frac{x+y+z}{4(x+y+z)} = \frac{1}{4}$ **(Ans.)**

81. If the average of 'm' numbers is n^2 and that of 'n' numbers is m^2, then the average of (m + n) numbers is- [BB AD 23]
A. m + n B. m – n C. $\frac{m}{n}$ D. mn **Ans: D**

Explanation:
The average of 'm' numbers is n^2. So, total of m numbers = mn^2
The average of 'n' numbers is m^2. So, total of n numbers = nm^2
$\therefore$ Average of (m + n) = $\frac{mn^2+nm^2}{m+n} = \frac{mn(n+m)}{m+n}$ = mn **(Ans.)**

82. P and Q started a business in the ratio of 2: 3. After 2 year P left the business but Q continues. After 3 years he had the profit of Tk. 26000. What is the profit of P? [BB AD 23]
A. Tk. 8000 B. Tk. 15600 C. Tk. 18000 D. No profit **Ans: A**

Explanation:
P: Q = (2×2): (3×3) = 4: 9 = 1: 3 [Profit ratio = Investment × Time]
$\therefore$ P's share = Tk. $(\frac{4}{4+9} \times 26000)$ = Tk. 8000 **(Ans.)**

83. A square park is surrounded by a path of uniform width 2 meters all around it. The area of the path is 288 sq. m. Find the perimeter of the park. [BB AD 23]
A. 34 m B. 1156 m C. 136 m D. Cannot be determined **Ans: C**

Explanation:
Let, one side of the square be x meters.
So, one side with path = x + 2 + 2 = (x + 4) meters.
As per question,
$(x+4)^2 - x^2 = 288$
Or, $x^2 + 2.x.4 + 4^2 - x^2 = 288$
Or, 8x + 16 = 288 Or, 8x = 288 – 16 = 272 $\therefore$ x = 34
$\therefore$ Perimeter of the park = 4×34 = 136 meters. **(Ans.)**

84. The area of a rectangular field is 52,000 sq. meters. This rectangular area has been drawn on a map to the scale of 1 cm to 100 m. The length is shown as 3.25 cm on the map, the breadth of the rectangular field in the map is- [BB AD 23]
A. 1.6 m B. 160 m C. 160 cm D. 1.6 cm **Ans: B**

Explanation:
Given that,
1 cm = 100 m
১টি ম্যাপ এমনভাবে আঁকা হয়েছে যেনো ম্যাপের ১সেমি সমান প্রকৃত ১০০ মিটার হয়।
So, 3.25 cm = 100×3.25 m = 325 m
$\therefore$ Length = 325 m.
$\therefore$ Breadth = $\frac{Area}{Length} = \frac{520000}{325}$ = 160 m **(Ans.)**

85. If 3 sides of a triangle are 6 cm, 8 cm and 10 cm, then the altitude of the triangle, using the largest side as its base, will be- [BB AD 23]
A. 4.8 cm B. 4.4 cm C. 6 cm D. 8 cm **Ans: A**

Explanation:
Given that, the largest side as its base. So, base = 10 cm and other two sides are 6 cm and 8 cm.
অর্ধপরিসীমা, s = $\frac{a+b+c}{2} = \frac{6+8+10}{2}$ = 12 cm
$\therefore$ Area of the triangle = $\sqrt{s(s-a)(s-b)(s-c)} = \sqrt{12(12-6)(12-8)(12-10)}$
$= \sqrt{12 \times 6 \times 4 \times 2} = \sqrt{24 \times 24} = 24\ cm^2$
We know,
Area = $\frac{1}{2}$×Base× Altitude
Or, 24 = $\frac{1}{2}$×10× Altitude
$\therefore$ Altitude = $\frac{24}{5}$ = 4.8 cm **(Ans.)**

86. Three boys agree to divide a bag of marbles in the following manner. The first boy takes one more than half the marbles. The second takes a third of the number remaining. The third boy finds that he is left with twice as many as the second boy. The original number of marbles is- [BB AD 23]

A. 38 B. 36 C. 32 D. Cannot be determined **Ans: D**

Explanation:

Let, total number of marbles be x.

The first boy takes $= \frac{x}{2} + 1$

Remaining $= x - (\frac{x}{2} + 1) = \frac{2x-x-2}{2} = \frac{x-2}{2}$

The second boy takes $= \frac{1}{3}$ of $\frac{x-2}{2} = \frac{x-2}{6}$

$\therefore$ Remaining $= \frac{x-2}{2} - \frac{x-2}{6}$

As per question, the third boy takes

$\frac{x-2}{2} - \frac{x-2}{6} = 2\times\frac{x-2}{6}$

Or, $\frac{3x-6-x+2}{6} = \frac{x-2}{3}$ Or, $\frac{2x-4}{6} = \frac{x-2}{3}$

Or, $6x - 12 = 6x - 12$ Or, $6x - 6x = 12 - 12$ $\therefore 0 = 0$

$\therefore$ So, it cannot be determined (**Ans.**)

87. In a class of 65 students and 4 teachers, each student got sweets that are 20% of the total number of students and each teacher got sweets that are 40% of the total number of students. How many sweets are there? [BB AD 23]

A. 104 B. 845 C. 949 D. 897 **Ans: C**

Explanation:

Number of sweets each student get = 20% of 65 = 13

Number of sweets each teacher get = 40% of 65 = 26

$\therefore$ Total sweets = $13\times65 + 4\times26 = 845 + 104 = 949$ (**Ans.**)

88. To fill a tank, 25 buckets of water is required. How many buckets of water will be required to fill the same tank if the capacity of the bucket is reduced to two-fifth of its present? [BB AD 14, BB AD 23]

A. 10 B. 35 C. 62.5 D. None of these **Ans: C**

Explanation:

If the capacity of each buckets 1 unit then required 25 buckets

$\therefore$ If the capacity of each buckets $\frac{2}{5}$ unit then required $\frac{25}{\frac{2}{5}} = 25\times\frac{5}{2} = 62.5$ buckets(**Ans.**)

89. A circle and a rectangular have same perimeter. The sides of the rectangle are 18 cm and 26 cm. What is the area of the circle? [BB AD 23]

A. 1250 sq. cm B. 616 sq. cm C. 154 sq. m D. 88 sq. cm **Ans: B**

Explanation:

Perimeter of the rectangle = 2(18 +26) cm = 88 cm

So, perimeter of the circle = 88 cm

As per question,

$2\pi r = 88$ [r = radius of the circle]

Or, $2\times\frac{22}{7}\times r = 88$ $[\pi = \frac{22}{7}]$

$\therefore r = \frac{88\times7}{2\times22} = 14$

$\therefore$ Area of the circle $= \pi r^2 = \frac{22}{7}\times(14)^2 = 616$ sq. cm (**Ans.**)

90. The present ages of three persons are in proportions 4: 7: 9. Eight years ago, the sum of their ages was 56. Find their present ages (in years). [Janata AEO 15, BB AD 23]

A. 8, 20, 28 B. 16, 28, 36 C. 20, 35, 45 D. None of these **Ans: B**

Explanation:

Let, the present age of three persons be 4x, 7x and 9x respectively.

As per question,

$(4x-8) + (7x-8) + (9x-8) = 56$

Or, $20x - 24 = 56$

Or, $20x = 56 + 24$ Or, $20x = 80$ $\therefore x = 4$

$\therefore$ The present age of 1st person $= 4\times4 = 16$ years, 2nd person $= 7\times4 = 28$ years and 3rd person $= 9\times4 = 36$ years. (**Ans.**)

91. A cricketer whose bowling average is 12.4 runs per wicket. If he takes 5 wickets for 26 runs and thereby decreases his average by 0.4. The number of wickets taken by him till the last match was? [BB AD 23]

অনুবাদঃ

একজন বোলারের উইকেট প্রতি গড় রান ১২.৪। যদি সে ২৬ রান দিয়ে ৫ উইকেট পায় তাহলে তার গড় ০.৪ কমে যাবে। শেষ ম্যাচ পর্যন্ত কতটি উইকেট পেয়েছিল?

A. 64 B. 72 C. 80 D. 85 **Ans: D**

Explanation:

Let, the number of wickets taken till last match be x.
So, total runs up to last match = 12.4x
According to the question,

এখানে ২য় লাইনের যে ৫ উইকেটের কথা বলা হয়েছে সেটি সমাধানের একটি শর্ত তাই উত্তর ৮৫+৫ =৯০ হবে না।

$\frac{12.4x+26}{x+5} = 12.4-0.4$

Or, 12.4x +26 = 12(x+5) Or, 12.4x +26 = 12x + 60
Or, 12.4x – 12x = 60 -26 Or, 0.4x = 34 ∴ x = 85.
Ans: 85 wickets.

92. If 1 is added to the numerator of a fraction, the fraction becomes 1. If 1 is added to the denominator, the fraction becomes $\frac{1}{2}$. Find the fraction. [BB Cash 23]

A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{2}{3}$ D. $\frac{3}{4}$ **Ans: C**

Explanation:

Let, the required fraction be $\frac{x}{y}$.

1st condition,

$\frac{x+1}{y} = 1$

∴ y = x + 1 ….. (i)

2nd condition,

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

Or, 2x = y + 1 = x + 1 + 1 [From equation (i)]
Or, 2x = x + 2 Or, 2x – x = 2 ∴ x = 2
Putting the value of x in equation (i)
∴ y = 2 + 1 = 3
∴ The fraction = $\frac{2}{3}$ (**Ans.**)

93. Students of a class stand to a queue. If Ratan is 19th in order from both ends, how many students are there in the queue? [BB Cash 23]

A. 20 B. 37 C. 38 D. 39 **Ans: B**

Explanation:

Total students = Number of students of right sides +1 + number of students of left sides
= 18 + 1 + 18 = 37 (**Ans.**)

94. If a person walks at 14km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is: [BDBL Officer 14, BKB Officer 17, Agrani SO(Cancelled) 17, BB Cash 23]

A. 50km B. 56 km C. 70 km D. 80 km **Ans: A**

Explanation:

Let, the actual distance travelled be x km.
According to the question,

$\frac{x}{10} = \frac{x+20}{14}$ [Time = $\frac{Distance}{Speed}$]

Or, 14x = 10x + 200 Or, 14x -10x = 200 Or, 4x = 200 ∴ x = 50
∴ The actual distance travelled = 50 km. (**Ans.**)

95. The cost of 9 mangoes and 5 apples is equal to the cost of 7 mangoes and 8 apples. Find the ratio between the cost of 1 mango and the cost of one apple. [BB Cash 23]

A. 3: 2 B. 2: 3 C. 5: 8 D. 9: 7 **Ans: A**

Explanation:

As per question,
9M + 5A = 7M + 8A
Or, 9M – 7M = 8A – 5A Or, 2M = 3A ∴ $\frac{M}{A} = \frac{3}{2}$ = 3: 2 (**Ans.**)

96. $2^{30} + 2^{30} + 2^{30} + 2^{30} =$? **[Janata EO(FA) 15, SEBL PO 16, Janata Cash 20, BB Cash 23]**

A. 2^{120} B. 2^{30} C. 2^{32} D. 2^{60} **Ans: C**

Explanation:

$2^{30} + 2^{30} + 2^{30} + 2^{30} = 4 \times 2^{30} = 2^2 \times 2^{30} = 2^{32}$ (**Ans.**)

97. If the sum of 3 consecutive integers is 210, then the sum of the two smaller integers is: **[Bank Asia TO 16, BB Cash 23]**

A. 139 B. 140 C. 141 D. cannot be determined **Ans: A**

Explanation:

Let, the numbers be x, x+1, x+2.

As per question,

x + x+1+ x+2 = 210

Or, 3x + 3 = 210 Or, 3x = 210- 3 Or, 3x = 207 ∴ x = 69

∴ The sum of the two smaller integers = 69 + 69 +1 = 139(**Ans.**)

98. A shopkeeper has sufficient money to buy 50 books. On reduction in the price of each book by Tk. 4, he could buy 10 books more. How much money does he has? **[BB Cash 23]**

A. Tk. 1000 B. Tk. 1500 C. Tk. 1200 D. Tk. 2000 **Ans: C**

Explanation:

Let, the price of each books be Tk. x.

As per question,

50×x = (50 +10)(x-4)

Or, 50x = 60x – 240

Or, 60x – 50x = 240 Or, 10x = 240 ∴ x = 24

∴ The price of each books = Tk. 24.

So, shopkeepers has Tk. (50×24) = Tk. 1200(**Ans.**)

Alternative method:

Let, shopkeeper has Tk. x.

As per question,

$\frac{x}{50} = \frac{x}{50+10} + 4$ [Each books price = $\frac{Total\ money}{Number\ of\ books}$]

Or, $\frac{x}{50} = \frac{x+240}{60}$

Or, 60x = 50x + 12000

Or, 60x – 50x = 12000 Or, 10x = 12000 ∴ x = 1200

∴ Shopkeepers has Tk. 1200.(**Ans.**)

99. Present age of Fariha is trice the present age of Samira who is 20. How many years ago was the age of Fariha five times that of Samira? **[BB Cash 23]**

A. 3 B. 6 C. 7.5 D. 10 **Ans: D**

Explanation:

The present age of Samira = 3×20 = 60 years.

Let, x years ago Fariha be five times that of Samira.

As per question,

60-x = 5(20-x)

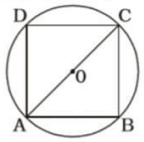
Or, 60 –x = 100 – 5x Or, 5x –x = 100- 60 Or, 4x = 40

∴ x = 10 years. (**Ans.**)

100. The length of one side of a square inscribed in a circle is 2. What is the area of the circle? **[BB Cash 23]**

A. $\frac{\pi}{2}$ B. π C. √2π D. 2π **Ans: D**

Explanation:



One side of the square = 2. So, diagonal = 2√2.

According to the figure diameter of the circle = 2√2. So, radius = $\frac{2\sqrt{2}}{2} = \sqrt{2}$

∴ Area of the circle = $\pi \times (\sqrt{2})^2 = \pi \times 2 = 2\pi$ (**Ans.**)

101. If $a^2 + b^2 = 45$ and $ab = 18$, find $\frac{1}{a} + \frac{1}{b} = ?$ [BB Cash 23]

A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{2}{3}$ D. $\frac{1}{4}$ **Ans: B**

Explanation:

We know,

$(a + b)^2 = a^2 + b^2 + 2ab = 45 + 2\times18 = 45 + 36 = 81$

$\therefore a + b = \sqrt{81} = 9$

$\therefore \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{9}{18} = \frac{1}{2}$ **(Ans.)**

102. A man deposits certain amount in his bank account. After a few days, he withdraw half of the money deposited and deposits Tk. 500 more. If he has a balance of Tk. 2000 in his bank account, find the amount deposited initially. [BB Cash 23]

A. Tk. 1500 B. Tk. 2000 C. Tk. 2500 D. Tk. 3000 **Ans: D**

Explanation:

Let, initial deposit amount be Tk. x.

As per question,

$(x - \frac{x}{2}) + 500 = 2000$

Or, $\frac{2x-x}{2} = 2000 - 500$ Or, $\frac{x}{2} = 1500$ $\therefore x = 3000$

$\therefore$ Initial deposit amount Tk. 3000**(Ans.)**

103. A worker earns Tk. 250 on the first day and spends Tk. 200 on the second day, earns Tk. 250 on the third day and again spends Tk. 200 on the fourth day and so on. On which day would he have had Tk. 1000? [BB Cash 23]

A. 20th day B. 30th day C. 31th day D. 40th day **Ans: C**

Explanation:

এক শ্রমিক প্রতি ১ম দিন ২৫০ টাকা আয় করে এবং ২য় দিনে ২০০ টাকা ব্যয় করে অর্থাৎ প্রতি ২ দিনে ৫০ টাকা জমা হয়। মোট ১০০০ টাকা জমা হতে কত দিন প্রয়োজন তা বের করতে হবে তাই প্রথমে (১০০০ -২৫০) = ৭৫০ টাকা আয় করার প্রয়োজনীয় সময় হিসাব করতে হবে কারন সর্বশেষ ২৫০ টাকা আয় করলে মোট ১০০০ টাকা জমা হবে।

৫০ টাকা জমা করে ২ দিনে

৭৫০ টাকা জমা করে $\frac{২\times৭৫০}{৫০}$ = ৩০ দিনে

$\therefore$ মোট সময় = ৩০+১ = ৩১ দিন **(Ans.)**

104. In a group of 135 persons, 50% people contributed Tk. 40 each, 30% contributed Tk. 60 each and the remaining person contributed Tk. 80. Find the average contribution for the group. [BB Cash 23]

A. Tk. 50 B. Tk. 54 C. Tk. 60 D. Tk. 62 **Ans: B**

Explanation:

50% people contributed = 50% of 135×40 = Tk. 2700

30% people contributed = 30% of 135×60 = Tk. 2430

20% people contributed = 20% of 135×80 = Tk. 2160

$\therefore$ The average contribution = $\frac{2700+2430+2160}{135} = \frac{7290}{135}$ = Tk. 54**(Ans.)**

105. If $a^x = b$ and $b^y = a$, then find the value of xy. [BB Cash 23]

A. 1 B. 0 C. a D. y **Ans: A**

Explanation:

Given that,

$b^y = a$

Or, $(a^x)^y = a$ Or, $a^{xy} = a^1$ $\therefore xy = 1$ **(Ans.)**

106. If 4% of (P + Q) are 8 and P is a positive integer. What is the greatest possible value of Q? [BB Cash 23]

A. 200 B. 199 C. 198 D. 196 **Ans: B**

Explanation:

As per question,

4% of (P + Q) = 8

Or, $\frac{4}{100}(P + Q) = 8$ Or, $\frac{1}{25}(P + Q) = 8$ Or, P + Q = 200

$\therefore Q = 200 - P = 200 - 1 = 199$

যেহেতু P একটি ধনাত্মক পুর্ণ সংখ্যা এবং ১ হচ্ছে সব থেকে ছোট ধনাত্মক পুর্ণ সংখ্যা, তাই Q এর সর্বোচ্চ মান হবে ১৯৯।**(Ans.)**

107. Income of A is 25% less than B. What percent B's income would be more than A? [BB Cash 23]

A. 35% B. 33.33% C. 30% D. 25% **Ans: B**

Explanation:

Let, B's income be Tk. 100. So, A's income = 75% of Tk. 100 = Tk. 75

∴ Required percentage = $\frac{25}{100-25}\times100\% = \frac{25}{75}\times100\% = 33.33\%$ **(Ans.)**

108. If a rectangle's length and width are both doubled, by what percent is the rectangle's area increased? [BB Cash 23]

A. 50% B. 100% C. 200% D. 300% **Ans: D**

Explanation:

Let, length and breadth be x and y respectively.

∴ Area = xy

New length = 2x and new breadth = 2y

∴ New area = 2x×2y = 4xy

∴ The percentage of area increased = $\frac{4xy-xy}{xy}\times100\% = 300\%$ **(Ans.)**

109. A box contains 90 nuts each of 100 gm and 100 bolts each of 150 gm. If the entire box weights 35.5 kg, then find the weight of the empty box. [BB Cash 23]

A. 10.5 kg B. 11 kg C. 11.5 kg D. 24kg **Ans: C**

Explanation:

Total weight of nuts and bolts = (90×100 +100×150) gm = (9000 +15000) gm = 24000 gm = 24 kg

∴ The weight of empty box = (35.5 - 24) kg = 11.5 kg **(Ans.)**

110. A wholesaler bought 1200 radios for Tk. 18 each. The wholesaler sold 60% of radios for Tk. 30 each and the rest for Tk. 15 each. What is the wholesaler's average (arithmetic mean) profit per radio? [BB Cash 23]

A. Tk. 6 B. Tk. 5 C. 4 D. 3 **Ans: A**

Explanation:

Total cost = Tk. (1200×18) = Tk. 21600

Total selling price = 60% of 1200×30 + 40% of 1200×15 = 21600 + 7200 = Tk. 28800

∴ Average profit = $\frac{28800-21600}{1200}$ = Tk. 6 **(Ans.)**

111. If a person walks at 14km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is: [BDBL Officer 14, BKB Officer 17, Agrani SO(Cancelled) 17, BB Cash 23]

A. 50km B. 56 km C. 70 km D. 80 km **Ans: A**

Explanation:

Let, the actual distance travelled be x km.

According to the question,

$\frac{x}{10} = \frac{x+20}{14}$ [Time = $\frac{Distance}{Speed}$]

Or, 14x = 10x + 200 Or, 14x -10x = 200 Or, 4x = 200 ∴ x = 50

∴ The actual distance travelled = 50 km. **(Ans.)**

112. Eight people are planning to share equally the cost of a rental car. If one person withdraws from the arrangement and the others share equally the entire cost of the car, then the share of each of the remaining persons will be increased by- [BB Cash 23]

A. $\frac{1}{8}$ B. $\frac{1}{7}$ C. $\frac{7}{8}$ D. None **Ans: B**

Explanation:

ধরি, মোট ভাড়া ৮টাকা এবং প্রত্যেকে ১ টাকা করে দিলে মোট ৮ টাকা হয়। তাহলে জন প্রতি ভাড়া ১ টাকা।

অপরদিকে, ১ জন না যাওয়ায় ৭ জনকে মোট ৮টাকা দিতে হবে। তাহলে জন প্রতি ভাড়া দিতে হবে = $\frac{৮}{৭}$ টাকা।

∴ Each person's cost increased = $\frac{8}{7} - 1 = \frac{8-7}{7} = \frac{1}{7}$ **(Ans.)**

113. $\sqrt{\frac{4}{3}} - \sqrt{\frac{3}{4}} = ?$ [Janata RC 23]

A. $\frac{4\sqrt{3}}{6}$ B. $\frac{1}{2\sqrt{3}}$ C. 1 D. $-\frac{1}{2\sqrt{2}}$ **Ans: B**

Explanation:

$\sqrt{\frac{4}{3}} - \sqrt{\frac{3}{4}} = \frac{2}{\sqrt{3}} - \frac{\sqrt{3}}{2} = \frac{4-3}{2\sqrt{3}} = \frac{1}{2\sqrt{3}}$ **(Ans.)**

114. $4^{x+y} = 1$ and $4^{x-y} = 4$, then the value of x and y respectively are- [Janata RC 23]

A. $\frac{1}{2}$ and $\frac{1}{2}$ B. $-\frac{1}{2}$ and $-\frac{1}{2}$ C. $\frac{1}{2}$ and $-\frac{1}{2}$ D. $\frac{1}{2}$ and $\frac{1}{2}$ **Ans: C**

Explanation:

1st condition, $4^{x+y} = 1$

Or, $4^{x+y} = 4^0$

$\therefore x+y = 0$ .....(i)

2nd condition, $4^{x-y} = 4$

Or, $4^{x-y} = 4^1$

$\therefore x-y = 1$ ..... (ii)

Now, (i)+ (ii)=>

$2x = 0 + 1 = 1$ $\therefore x = \frac{1}{2}$

Putting the value of x in equation (i)

$\frac{1}{2} + y = 0$ $\therefore y = -\frac{1}{2}$

Ans: $x = \frac{1}{2}$ and $y = -\frac{1}{2}$.

115. The ages of Sabiha and Suriya are in the ratio 7: 3 respectively. After 6 years, the ratio of their ages will be 5: 3. What is the difference in their ages? [Uttara PO 17, Janata RC 23]

A. 6 years B. 8 years C. 10 years D. 12 years **Ans: B**

Explanation:

Let, the ages of Samina and Sultana be 7x and 3x respectively.

As per question,

$\frac{7x+6}{3x+6} = \frac{5}{3}$

Or, $21x + 18 = 15x + 30$ Or, $21x-15x = 30-18$ Or, $6x = 12$ $\therefore x = 2$

$\therefore$ The age difference = $7x-3x = 4x = 4\times2 = 8$ (**Ans.**)

116. A scored 30% marks and failed by 15 marks. B scored 40% marks and obtained 35 marks more than those required to pass. The pass percentage is? [Janata RC 23]

অনুবাদঃ

A, ৩০% নম্বর পেয়ে ১৫ নম্বরের জন্য অকৃতকার্য হয়। B, ৪০% নম্বর পায় যা কৃতকার্য হতে যে নম্বর লাগবে তার চেয়ে ৩৫ বেশি। কৃতকার্য হতে শতকরা কত নম্বর পেতে হবে?

A. 33% B. 38% C. 43% D. 46% **Ans: A**

Explanation:

Let, total mark be x.

According to the question,

30% of x +15 = 40% of x – 35

Or, $0.3x +15 = 0.4x -35$ Or, $0.4x -0.3x = 35+15$

Or, $0.1x = 50$ $\therefore x = 500$.

$\therefore$ Passing marks = 30% of 500 +15 = 150+15 = 165.

$\therefore$ Pass percentage = $(\frac{165}{500} \times 100)$ % = 33% (**Ans.**)

117. A, B and C are partners in a business. Their shares are in the proposition of $\frac{1}{3}$: $\frac{1}{4}$: $\frac{1}{5}$, A withdraws half of his capital after 15 months and after another 15 months, a profit of Tk. 4340 is divided. The share of C is- [Janata RC 23]

A. Tk. 1240 B. Tk. 1250 C. Tk. 1300 D. Tk. 1400 **Ans: A**

Explanation:

A: B: C = $\frac{1}{3}$: $\frac{1}{4}$: $\frac{1}{5}$ = $\frac{1}{3}\times60$: $\frac{1}{4}\times60$: $\frac{1}{5}\times60$ = 20: 15: 12

Let, initial investment of A, B and C be Tk. 20x, Tk. 15x and Tk. 12x respectively.

Profit will be distributed according to equivalent investment.

Equivalent Investment = Investment ×Time

A: B: C = (20x×15 + 10x×15): 15x×30 + 12x×30 [Total time = 15 + 15 = 30 months]

= 450x: 450x: 360x = 5: 5: 4

$\therefore$ C's share = Tk. $(\frac{4}{5+5+4}\times4340)$ = Tk. 1240 (**Ans.**)

118. Two coins are tossed. What is the probability of getting at most one head? [Janata RC 23]

A. $\frac{1}{2}$ B. $\frac{1}{4}$ C. $\frac{3}{4}$ D. $\frac{1}{6}$ **Ans: C**

Explanation:

২টি মুদ্রা নিক্ষেপ করলে ৪ ধরণের ঘটনা ঘটতে পারে। যথা-{H,H},{H,T},{T,H},{T,T}

এর মধ্যে বড় জোড় ১টি হেড থাকবে অর্থাৎ ০ অথবা ১টির হেড পাওয়ার অনুকূল ঘটনা ৩টি। যথা{T,T},{H,T},{T,H}

$\therefore$ Probability = $\frac{\text{Favourable outcomes}}{\text{Total Outcomes}} = \frac{3}{4}$ (**Ans.**)

119. A train with length of 150 m long takes 30 seconds to cross a 500 m long bridge. How much time will the train take to cross a 370 m long platform? [Janata RC 23]

A. 18 sec B. 24 sec C. 30 sec D. 36 sec **Ans: B**

Explanation:

Total length of train and bridge = (150 + 500) m = 650 m

Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{150+500}{30}$ m/s = $\frac{650}{30}$ m/s = $\frac{65}{3}$ m/s

Total length of train and platform = (150 + 370) m = 520 m

∴ Time = $\frac{\text{Distance}}{\text{Speed}} = \frac{520}{\frac{65}{3}}$ sec = $520\times\frac{3}{65}$ sec = 24 sec (**Ans.**)

120. A boat covers 143 km upstream in 13 hours and the same distance downstream in 11 hours. What is the speed (in km/hr) of the boat in still(without stream) water? [Janata RC 23]

A. 10 km/hr B. 12 km/hr C. 14 km/hr D. 8 km/hr **Ans: B**

Explanation:

Boat sailing against the current = $\frac{143}{13}$ = 11 km/h and sailing with the current = $\frac{143}{11}$ = 13 km/h.

Boat's speed+ current's speed = 13 km/h

Boat's speed- current's speed = 11 km/h

2×current's speed = 13- 11 = 2 km/h [By subtracting]

∴ Current's speed = $\frac{2}{2}$ = 1 km/h.

∴ Speed of the current = 1 km/h

∴ Speed of the boat = (13-1) km/h = 12 km/h. (**Ans.**)

121. A man buys an article for 10% less than its value and sells it for 10% more than its value. His gain or loss percentage is- [Janata RC 23]

A. No profit, no loss B. 20% profit

C. Less than 20% profit D. More than 20% profit **Ans: D**

Explanation:

Let, value of the article Tk. 100

So, at 10% less cost price = 90% of Tk. 100 = Tk. 90

At 10% profit, selling price = 110% of Tk. 100 = Tk. 110

Profit percentage = $\frac{110-90}{90}\times100\% = \frac{200}{9}\% = 22\frac{2}{9}\%$

So, more than 20% profit. (**Ans.**)

122. A reservoir has two pipes, A and B. A can fill the reservoir 5 hours faster than B. If both together fill the reservoir in 6 hours, the reservoir will be filled by A alone in- [Janata RC 23]

A. 8 hours B. 10 hours C. 11 hours D. 12 hours **Ans: B**

Explanation:

Let, A can fill in x hours. So, B can fill in (x +5) hours.

As per question,

$\frac{1}{x} + \frac{1}{x+5} = \frac{1}{6}$

Or, $\frac{x+5+x}{x(x+5)} = \frac{1}{6}$ Or, $\frac{2x+5}{x(x+5)} = \frac{1}{6}$

Or, $x^2 + 5x = 12x + 30$ Or, $x^2 + 5x - 12x - 30 = 0$

Or, $x^2 - 7x - 30 = 0$ Or, $x^2 - 10x + 3x - 30 = 0$

Or, x(x -10) + 3(x -10) = 0 Or, (x -10)(x + 3) = 0 ∴ x = 10

∴ A alone can fill in 10 hours. (**Ans.**)

123. If the area of a triangle with base x is equal to the area of a square with side x, then the altitude of the triangle is- [Janata RC 23]

A. $\frac{x}{2}$ B. x C. 2x D. 3x **Ans: C**

Explanation:

Given that, base of the triangle = x and one side of the square = x

As per question,

Area of the triangle = Area of the square

$\frac{1}{2}\times$Base ×Altitude = x^2

Or, $\frac{1}{2}\times$x ×Altitude = x^2 Or, $\frac{1}{2}\times$Altitude = x

∴ Altitude = 2x (**Ans.**)

124. How many different numbers of two digits can be formed with the digits 1, 2, 3, 4, 5, 6; no digit being repeated? [Janata RC 23]

A. 40 B. 30 C. 35 D. 45 **Ans: B**

Explanation:

যেহেতু কোন অংক একের অধিকবার ব্যবহার করা যাবে না তাই দুটি অংক বিশিষ্ট সংখ্যার ১ম স্থানে ৬ অংক টি অংক বসতে পারে এবং ২য় স্থানে বাকি ৫টি সংখ্যা বসতে পারে। মোট সাজানো সংখ্যা হবে = ৬×৫ = ৩০ (**Ans.**)

Short cut:

${}^6P_2 = \frac{6!}{(6-2)!} = \frac{6\times5\times4!}{4!} = 30$ (**Ans.**)

125. A student walks from his house at a speed of $2\frac{1}{2}$ km per hour and reaches his school 6 minutes late. The next day he increases his speed by 1 km per hour and reaches 6 minutes before school time. How far is the school from his house? [Janata RC 23]

A. $1\frac{1}{4}$ km B. $1\frac{3}{4}$ km C. $2\frac{1}{4}$ km D. $2\frac{3}{4}$ km **Ans: B**

Explanation:

Let, distance be x km.

∴ Difference of time = (6+ 6) min = 12 min = $\frac{12}{60}$ hour = $\frac{1}{5}$ hour.

As per question,

$\frac{x}{2.5} - \frac{x}{3.5} = \frac{1}{5}$

Or, $\frac{10x}{25} - \frac{10x}{35} = \frac{1}{5}$ Or, $\frac{10x}{5} - \frac{10x}{7} = 1$ [Multiplying by 5]

Or, $\frac{70x-50x}{35} = 1$ Or, $\frac{20x}{35} = 1$ Or, 20x = 35 ∴ $x = \frac{35}{20} = 1\frac{3}{4}$ km

∴ The distance = $1\frac{3}{4}$ km. (**Ans.**)

126. An investor earns 3% return on $\frac{1}{4}$th of his capital, 5% on $\frac{2}{3}$rd and 11% on the reminder. What is the average rate of return he earns on his total capital? [Janata RC 23]

A. 5% B. 5.5% C. 10% D. 10.5% **Ans: A**

Explanation:

Let, total investment be Tk. x

Return from 1st investment = 3% of $\frac{x}{4} = \frac{3x}{400}$

Return from 2nd investment = 5% of $\frac{2x}{3} = \frac{5}{100}\times\frac{2x}{3} = \frac{x}{30}$

Remaining = $x - \frac{x}{4} - \frac{2x}{3} = \frac{12x-3x-8x}{12} = \frac{x}{12}$

Return from 3rd investment = 11% of $\frac{x}{12} = \frac{11x}{1200}$

∴ Total return = $\frac{3x}{400} + \frac{x}{30} + \frac{11x}{1200} = \frac{9x+40x+11x}{1200} = \frac{60x}{1200} = \frac{x}{20}$

∴ Average rate of return = $\frac{\frac{x}{20}}{x}\times100\% = 5\%$ (**Ans.**)

127. What is the average of odd numbers from 1 to 40? [Janata RC 23]

A. 20 B. 21 C. 31 D. 41 **Ans: A**

Explanation:

We know, sum of first n natural odd numbers = n^2

১ থেকে ৪০ পর্যন্ত বেজোড় সংখ্যা আছে ২০ টি। অর্থাৎ ১ থেকে ৪০ পর্যন্ত বেজোড় সংখ্যাগুলোর যোগফল= $২০^২ = ৪০০$

∴ Required average = $\frac{400}{20} = 20$ (**Ans.**)

128. If the radius of a circle is reduced by 40%, its circumference is reduced by- [Janata RC 23]

A. 60% B. 40% C. 35% D. 30% **Ans: B**

Explanation:

ব্যাসার্ধ ৪০% কমালে পরিসীমাও ৪০% কমে যাবে।

129. The complement of an angle exceeds the angle by 60^0. Then the angle is equal to-[Janata RC 23]

A. 15^0 B. 25^0 C. 30^0 D. 35^0 **Ans: A**

Explanation:

Let, the angle be x^0. So, complement angle 90-x.

As per question,

(90-x) – x= 60

Or, 90 -60 = x + x Or, 2x = 30 ∴ $x = \frac{30}{2} = 15$ (**Ans.**)

130. If in ΔABC, AB = 6cm, BC = 12cm and CA = $6\sqrt{3}$cm, then the measure of ∠A is-[Janata RC 23]

A. 30° B. 45° C. 60° D. 90° **Ans: D**

Explanation:

$AB^2 = 6^2 = 36$, $BC^2 = 12^2 = 144$ and $CA^2 = (6\sqrt{3})^2 = 108$

Here, $BC^2 = AB^2 + CA^2$ [144 = 36 + 108]

So, we can say ΔABC is right angle and $\angle A = 90^0$ (**Ans.**)

131. If x is an integer, then which of the following statements about x^2 -x-1 is true?[Janata RC 23]

A. It is always odd B. It is always even

C. It is always positive D. It is even when x is even and odd when x is odd **Ans: A**

Explanation:

When x = 2, then x^2 -x-1 = 2^2 – 2-1 = 4-3 = 1

When x = 3, then x^2 -x-1 = 3^2 – 3-1 = 9-4 = 5

∴ জোড় ও বিজোড় উভয় মানের জন্য সবসময় বেজোড় মান হবে। (**Ans.**)

132. A worker is hired for 7 days. Each day, he is paid 10 Tk. more than what he is paid for the preceding day one work. The total amount he was paid in the first 4 days of work equaled the total amount he was paid in the last 3 days. What was his starting pay? [Combined 9 Banks SO 23(2020 based), Combined 9 Banks Officer 23(2020 based)]

A. Tk. 90 B. Tk. 138 C. Tk. 150 D. Tk. 160 **Ans: A**

Explanation:

Let, starting pay be Tk. x

As per question,

x + x + 10 + x + 20 + x + 30 = x + 40 + x + 50 + x + 60

Or, 4x + 60 = 3x + 150 Or, 4x – 3x = 150 – 60 ∴ x = 90

∴ Starting pay = Tk. 90(**Ans.**)

133. The present ratio of students to teachers at a certain school is 30 to 1. If the student enrollment were to increase by 50 students and the number of teachers were to increase by 5, the ratio of students to teachers would then be 25 to 1. What is the present number of teachers? [Combined 9 Banks SO 23(2020 based), Combined 9 Banks Officer 23(2020 based)]

A. 8 B. 10 C. 12 D. 15 **Ans: D**

Explanation:

Let, the number of teachers be x. So, students be 30x.

As per question,

$\frac{30x+50}{x+5} = \frac{25}{1}$

Or, 30x + 50 = 25x + 125

Or, 30x – 25x = 125 -50 Or, 5x = 75 ∴ x = 15

∴ The present number of teachers = 15(**Ans.**)

134. In a factory, there are workers, executives and clerks. 58% of the employees are workers, 660 are executives and the remaining 264 employees are clerks. How many employees are there in the factory? [Combined 9 Banks SO 23(2020 based)]

A. 1500 B. 2000 C. 2200 D. 2500 **Ans: C**

Explanation:

Let, the number of employees be x.

As per question,

100x = 58% of 100x + 660 + 264

Or, 100x = 58x + 924

Or, 100x – 58x = 924 Or, 42x = 924 Or, $x = \frac{924}{42} = 22$

∴ 100x = 22×100 = 2200

∴ The number of employees = 2200 (**Ans.**)

135. Salam earns Taka 8.50 per hour on days other than Sundays and twice that rate on Sundays. Last week he worked a total of 50 hours, including 8 hours on Sunday. What were her earnings for the week? [Combined 9 Banks SO 23(2020 based)]

A. Tk. 340 B. Tk. 398 C. Tk. 408 D. Tk. 493 **Ans: D**

Explanation:

Sunday = 8 hours and others day = 50-8 = 42 hours.

∴ Total earnings = 42×8.5 + 8×(8.5×2) = 357 + 136 = Tk. 493 (**Ans.**)

136. A man sells 2 commodities for Tk. 4,000 each, neither losing nor gaining in the deal. If he sold one commodity at a gain of 25%, then what is the cost price of another commodity? [Combined 9 Banks SO 23(2020 based)]

A. Tk. 3200 B. 4800 C. Tk. 4000 D. Tk. 3600 **Ans: B**

Explanation:

Total selling price = Tk. (4000+4000) = Tk. 8000.

At 25% gain, cost price of one commodity = Tk. $(\frac{4000\times100}{125})$ = Tk. 3200

∴ Cost price of other commodity = Tk. (8000-3200) = Tk. 4800.(**Ans.**)

137. Find the number of zeroes in $10 \times 20 \times 30 \times ... \times 1000$. [Combined 9 Banks SO 23(2020 based)]

A. 100 B. 124 C. 130 D. 154 **Ans: B**

Explanation:

$10 \times 20 \times 30 \times ... \times 1000$

$= (10\times1)\times(10\times2)\times(10\times3)\times..... (10\times100)$

$= 10^{100}\ (1\times2\times3\times.....\times100)$

$= 10^{100} \times 100!$

10^{100} = মোট ১০০ টি শুন্য

১০০! এর মধ্যে কতটি শুন্য আছে তা নির্ণয়ের জন্য প্রথমে ১০০ কে ৫ দ্বারা ভাগ করতে হবে, ভাগফল ২০ কে আবার ৫ দ্বারা ভাগ করতে হবে।

∴ Number of zeros = $100 + \frac{100}{5} + \frac{20}{5} = 100 + 20 + 4 = 124$ (**Ans.**)

138. If $x+\frac{1}{x} = 2$, what is $x^3+\frac{1}{x^3}$? [Combined 5 Banks Officer 18, Janata RC 23]

A. 64 B. 14 C. 8 D. 2 **Ans: D**

Explanation:

Given that, $x+\frac{1}{x} = 2$

∴ $x^3+\frac{1}{x^3} = (x+\frac{1}{x})^3-3.x.\frac{1}{x}(x+\frac{1}{x}) = (x+\frac{1}{x})^3- 3(x+\frac{1}{x}) = (2)^3- 3\times2 = 8-6 = 2$ (**Ans.**)

139. The diameter of the driving wheel of a bus is 140 cm. How many revolutions per minute must the wheel make in order to keep a speed of 66 km per hour? [Combined 9 Banks SO 23(2020 based)]

A. 200 B. 250 C. 300 D. 350 **Ans: B**

Explanation:

66 km = 66,00,000 cm [1 km = 1,00,000 cm]

In 1 hour or 60 min, the wheel cover = 66,00,000 cm

∴ In 1 min, the wheel cover = $\frac{66,00,000}{60}$ = 110,000

We know, perimeter of the wheel = $2\pi r$; r = radius of the wheel = $\frac{140}{2}$ = 70 cm

So, in each revolution the wheel covers $2\pi r$ meters.

∴ Perimeter = $2\pi r = 2\times\frac{22}{7}\times70 = 440$

∴ The number of revolution = $\frac{110,000}{440}$ = 250 (**Ans.**)

140. The average monthly income of P and Q is Tk. 5050. The average monthly income of Q and R is Tk. 6250 and the average monthly income of P and R is Tk. 5200. The monthly income of P is? [Combined 9 Banks SO 23(2020 based)]

অনুবাদঃ

P ও Q এর মাসির গড় আয় ৫০৫০ টাকা। Q ও R এর মাসিক গড় আয় ৬২৫০ এবং P ও R এর মাসিক গড় আয় ৫২০০ টাকা। P এর মাসিক আয় কত?

A. Tk. 4000 B. Tk. 6100 C. Tk. 6400 D. Tk. 16500 **Ans: A**

Explanation:

According to the question,

$\frac{P+Q}{2}$ = Tk. 5050 ∴ P+Q = Tk. 10100.....(i)

$\frac{Q+R}{2}$ = Tk. 6250 ∴ Q+R = Tk. 12500.....(ii)

$\frac{P+R}{2}$ = Tk. 5200 ∴ P+R = Tk. 10400....(iii)

(i)+(ii)+(iii)=>

2(P+Q+R) = 33000

Or, P+Q+R = $\frac{33000}{2}$ = 16500

Or. P = 16500- (Q+R)

Or. P = = 16500-12500 [Q+R = 12500]

∴ P = 4000

∴ The monthly income of P = Tk. 4000. (**Ans.**)

141. The perimeter of the rectangle is 20 cm. If the length of the rectangle is 6 cm, then find the breadth of the rectangle. [Combined 9 Banks SO 23(2020 based)]

A. 4 cm B. 6 cm C. 10 cm D. 14 cm **Ans: A**

Explanation:

We know,

Perimeter = 2(Length + Breadth)

Or, 20 = 2(6 + Breadth)

Or, 10 = 6 + Breadth [Dividing by 2]

∴ Breadth = 10 – 6 = 4 cm (**Ans.**)

142. If two jeans and three shirts cost Tk. 4000 and three jeans and two shirts costs Tk. 3500, then how much does a jeans cost? [Combined 9 Banks Officer 23(2020 based)]

A. Tk. 500 B. Tk. 1000 C. Tk. 1500 D. Tk. 2000 **Ans: A**

Explanation:

Let, the cost of each jeans be x and each shirt be y.

1st condition, 2nd condition,

$2x + 3y = 4000$…..(i) $3x + 2y = 3500$ …..(ii)

(ii)×3 – (i)×2=>

$9x + 6y – 4x – 6y = 10500 – 8000$

Or, $5x = 2500$ ∴ $x = 500$

∴ The cost of a jeans = Tk. 500(**Ans.**)

143. One-third of Ratan's Investment in National Saving Certificate is equal to one-half of his investment in FDR. If he has Tk. 150000 as total investment, how much he invested in savings certificate? [Combined 9 Banks Officer 23(2020 based)]

A. Tk. 30,000 B. Tk. 50,000 C. Tk. 60,000 D. Tk. 90,000 **Ans: D**

Explanation:

Let, he invested in saving certificate be Tk. x. So, he invested in FDR = Tk. (150,000 – x)

As per question,

$\frac{1}{3}$ of x = $\frac{1}{2}$ of (150,000 - x)

Or, $2x = 450,000 – 3x$ Or, $2x + 3x = 450,000$ Or, $5x = 450,000$

∴ $x = \frac{450,000}{5} = 90000$ (**Ans.**)

144. A man bought some eggs of which 10% are rotten. He gives 80% of the remainder to his neighbors. Now he is left out with 36 eggs. How many eggs he bought? [Combined 9 Banks Officer 23(2020 based)]

A. 40 B. 100 C. 200 D. 72 **Ans: C**

Explanation:

Let, the number of eggs bought be 100x.

After removing 10% rotten eggs, remaining = 100x – 10% of 100x = 100x – 10x = 90x

Neighbors got = 80% of 90x = 72x

∴ Remaining = 90x – 72x = 18x

As per question,

$18x = 36$

Or, $x = \frac{36}{18}$

∴ $100x = \frac{36×100}{18} = 200$

∴ The number of eggs he bought = 200 (**Ans.**)

145. If $x = a + \frac{1}{a}$ and $y = a - \frac{1}{a}$ then the value of $x^4 + y^4 - 2x^2y^2$ is? [Combined 9 Banks Officer 23(2020 based)]

A. 4 B. 8 C. 16 D. None of them **Ans: C**

Explanation:

$x = a + \frac{1}{a}$

∴ $x^2 = (a + \frac{1}{a})^2 = a^2 + \frac{1}{a^2} + 2$ [By squaring both sides]

And, $y = a - \frac{1}{a}$

∴ $y^2 = a^2 + \frac{1}{a^2} - 2$ [By squaring both sides]

Now, $x^4 + y^4 - 2x^2y^2 = (x^2 – y^2)^2 = (a^2 + \frac{1}{a^2} + 2 - a^2 - \frac{1}{a^2} + 2)^2 = 4^2 = 16$ (**Ans.**)

146. A man is needs money for 120 days. He asked the banker for a loan and the banker charged Tk. 360 @ 6% per annum. What was the amount of loan? [Combined Cash 08, MTB MTO 17, National PO 17, Combined 9 Banks SO 23(2020 based)]

A. Tk. 15000 B. Tk. 16000 C. Tk. 18000 D. Tk. None of these **Ans: C**

Explanation:

Interest, I = Tk. 360; rate of interest, r = 6%; time, n = 120 days = 4 months = $\frac{4}{12}$ year = $\frac{1}{3}$ year

$\therefore P = \frac{100I}{nr} = \frac{100\times360}{\frac{1}{3}\times6} = 18000$(**Ans.**)

147. If x = y = 2z and xyz = 256, then x= ? [Janata EO 12, Combined 9 Banks Officer 23(2020 based)]

A. 2 B. 4 C. 8 D. None of them **Ans: C**

Explanation:

Given that,

x = y = 2z; So, x = 2z and y = 2z

Now,

xyz = 256

Or, 2z×2z×z = 256 Or, $4z^3 = 256$ Or, $z^3 = \frac{256}{4} = 64 = 4^3$ $\therefore z = 4$

$\therefore x = 2z = 2\times4 = 8$(**Ans.**)

148. The monthly incomes of two persons are in the ratio 4:5 and their monthly expenditures are in the ratio of 7:9. If each saves BDT 50 per month find their monthly income? [Combined 9 Banks Officer 23(2020 based)]

অনুবাদঃ

২ জন ব্যক্তির মাসিক আয়ের অনুপাত ৪ ঃ ৫ এবং খরচের অনুপাত ৭ ঃ ৯। যদি প্রত্যেকেই প্রতি মাসে ৫০ টাকা জমা করেন তাহলে তাদের মাসিক আয় কত?

A. 400 and 600 B. 400 and 500 C. 500 and 400 D. None of these **Ans: B**

Explanation:

Savings = Income - Expenditure

Let, the income of the first person = Tk. x and second person = Tk. y

x: y = 4:5

Or, 5x = 4y $\therefore$ 5x - 4y = 0 .....(i)

Expenditure of first person = Tk. (x - 50) and second person = Tk. (y - 50)

(x - 50): (y - 50) = 7:9

Or, $\frac{(x-50)}{(y-50)} = \frac{7}{9}$ Or, 9x - 450 = 7y – 350

$\therefore$ 9x - 7y = 100 .....(ii)

Now, (ii)×4 – (i)×7 =>

36x-35x = 400 $\therefore$ x = 400

Putting the value of x in equation (i)

5×400 - 4y = 0 Or, 4y = 2000 $\therefore$ y = 500

$\therefore$ The income of first person = Tk. 400 and that of second person = Tk. 500

Ans: Tk. 400 and Tk. 500.

149. The total marks obtained by a student in Physics, Chemistry and Mathematics together is 120 more than the marks obtained by him in Chemistry. What is the average marks obtained by him in Physics and Mathematics together? [Combined 9 Banks SO 23(2020 based)]

A. 40 B. 60 C. 120 D. Cannot be determined **Ans: B**

Explanation:

As per question,

P + C + M = 120 + C

Or, P + M = 120 + C – C = 120

$\therefore \frac{P+M}{2} = \frac{120}{2} = 60$(**Ans.**)

150. A monkey climbs a 12-meters high slippery pillar. In his first minute, he climbs 2 meters, and in the next minute, he slips one meter down. In this way, how much time will he take to reach the top of the pillar? [Combined 9 Banks Officer 23(2020 based)]

A. 10 minutes B. 12 minutes C. 11 minutes D. 21 minutes **Ans: D**

Explanation:

Shortcut:

Total time = $\frac{\text{height of the pole}-\text{climbed distance}}{\text{climbed distance}-\text{slipped distance}}\times\text{Time} + 1 = \frac{12-2}{2-1}\times2+1 = 20+1 = 21$ min(**Ans.**)

151. The sum of the ages of the father and son is 80 years. If ten years ago the age of father was three times that of his son, find the present age of the son. [Combined 9 Banks Officer 23(2020 based)]

A. 55 B. 25 C. 15 D. 45 **Ans: B**

Explanation:

Let, the present age of son be x years. So, father's age = (80 –x) years.

As per question,

$3(x - 10) = (80-x) – 10$

Or, $3x – 30 = 80 –x – 10$

Or, $3x + x = 70 + 30$ Or, $4x = 100$ $\therefore x = 25$

∴ The present age of son = 25 years. (**Ans.**)

152. The sum of the squares of three numbers is 138, while the sum of their products taken two at a time is 131. Their sum is? [Combined 9 Banks Officer 23(2020 based)]

অনুবাদঃ

তিনটি সংখ্যার বর্গের সমষ্টি ১৩৮ এবং দুটি করে সংখ্যা গুণ করে যোগ করলে ১৩১ হয়। সংখ্যাগুলোর সমষ্টি কত?

A. 20 B. 30 C. 40 D. Cannot be determined **Ans: A**

Explanation:

Let, the numbers be a, b and c.

Given that,

$a^2+ b^2+ c^2 = 138$ and $ab+ bc+ ca = 131$.

We know,

$(a+ b+ c)^2 = a^2+b^2+c^2 + 2(ab+ bc+ ca) = 138 + 2\times131 = 400$

Or, $a+ b+ c = \sqrt{400}$

∴ $a+ b+ c = 20$ (**Ans.**)

153. Simple interest on a certain sum at the rate of 4.5% p.a. for 4 years differs by BDT 216. The sum is- [Combined 9 Banks Officer 23(2020 based)]

A. BDT 2100 B. BDT 2400 C. BDT 1800 D. None of these **Ans: B**

Explanation:

Let, the sum be Tk. 100x

According to the question,

$(100x\times4.5\%\times6)- (100x\times4.5\%\times4) = 216$ [Here, Interest (I) = Prn]

Or, $27x- 18x = 216$ Or, $9x = 216$ $\therefore 100x = \frac{216\times100}{9} = 2400$

∴ The sum = Tk. 2400. (**Ans**.)

154. If the product of three consecutive integers is 210, then the sum of integers is_ [Combined 9 Banks Officer 23(2020 based)]

A. 14 B. 15 C. 18 D. 21 **Ans: C**

Explanation:

2 | 210

3 | 105

5 | 35

7

$\therefore 210 = 2\times3\times5\times7 = 5\times6\times7$

So, the consecutive numbers are = 5, 6 and 7

∴ The sum of integers = 5 + 6 + 7 = 18(**Ans.**)

155. In a right triangle, the length of one of the legs is 3 and the length of the hypotenuse is 5. What is the length of other leg? [Combined 9 Banks Officer 23(2020 based)]

A. 4 B. 8 C. 16 D. None of these **Ans: A**

Explanation:

Other leg = $\sqrt{(Hypotenuse)^2 - (One\ leg)^2} = \sqrt{5^2 - 3^2} = \sqrt{25 - 9} = \sqrt{16} = 4$(**Ans.**)

NOTE: পিথাগোরাসের সূত্রানুসারে কোন সমকোনী ত্রিভুজের ক্ষেত্রে

২ বাহুর অনুপাত ৩: ৫ হলে অপর বাহু ৪ হবে। তিন বাহুর অনুপাত ৩:৪:৫।

156. A clock seen through a mirror, shows quarter past three. What is the correct time shown by the clock? [Combined 9 Banks Officer 23(2020 based), Combined 9 Banks SO 23(2020 based)]

A. 3: 15 B. 7: 15 C. 8: 45 D. 9: 45 **Ans: C**

Explanation:

A quarter past three = 3: 15

∴ Actual Time = 11:60 – 3: 15 = 8: 45(**Ans.**)

Formula:
∴ Actual time = 11:60 – mirror time

157. The average daily wage of 10 workers is Tk. 400. If the lowest wage is Tk. 300, what is the possible maximum wage in Tk? [Combined 9 Banks SO 23(2020 based), Combined 9 Banks Officer 23(2020 based)]

A. 1300 B. 1200 B. 1000 D. 800 **Ans: A**

Explanation:

∴ Possible maximum wage = Tk. (400×10 - 300×9) = Tk. (4000 – 2700) = Tk. 1300(**Ans.**)

158. A batsman makes a score of 80 runs in the 16th innings and increases average by 3. What is average after 16th innings? [Combined 9 Banks Officer 23(2020 based)]

A. 25 B. 29 C. 32 D. 35 **Ans: D**

Explanation: (Written Method)

Let the average of 15 innings be x. So, total runs in 15 innings = 15x

As per question,

$\frac{15x+80}{16} = x + 3$

Or, 16x + 48 = 15x + 80

Or, 16x -15x = 80 – 48

∴ x = 32

∴ Average runs after 16th innings = 32+3 = 35 (**Ans.**)

১৬ তম ইনিংসে ৮০ রান করায় গড় ৩ রান বৃদ্ধি হয়েছে।

∴ ১৬ তম ইনিংসের পর গড় হবে = ৮০-১৫×৩ = ৮০-৪৫ = ৩৫ রান।

Shortcut:

Runs scored in n-th inning = new average + [Old innings ×Change in average]

80 = New average + 15×3

∴ New average = 80 – 45 = 35(**Ans.**)

159. After fillings the car's fuel tank, a driver drove from P to Q and then to R. He used $\frac{2}{5}$th portion of the fuel driving from P to Q. If she used another 7 liters to drive from Q to R and still had $\frac{1}{4}$th of the tank left, how many liters does the tank hold? [Combined 9 Banks Officer 23(2020 based)]

A. 12 B. 18 C. 20 D. 21 **Ans:** C

Explanation:

Used fuel from P to Q driving + Unused fuel = $\frac{2}{5} + \frac{1}{4} = \frac{8+5}{20} = \frac{13}{20}$ part

∴ Used to drive from Q to R = $1 - \frac{13}{20} = \frac{20-13}{20} = \frac{7}{20}$ part

As per question,

$\frac{7}{20}$ part = 7 liters

∴ 1 part = $7 \times \frac{20}{7}$ = 20 liters.

∴ The tank hold = 20 liters. (**Ans.**)

160. A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. He gains 14% on the whole. The quantity sold at 18% profit is: [Pubali TA Teller 17, HBFC Officer 17, BB AD 22, Combined 9 Banks Officer 23(2020 based)]

A. 400 kg B. 560 kg C. 600 kg D. 640 kg **Ans: C**

Explanation:

Let, at 18% profit sold x kg of sugar. So, at 8% sold (1000-x) kg of sugar.

As per question,

18% of x + 8% of (1000-x) = 14% 0f 1000

Or, 0.18x + 80 -0.08x = 140 Or, 0.1x = 140-80 = 60 ∴ x = 600(**Ans.**)

161. If $\frac{x}{y} = \frac{1}{3}$, then $\frac{x^2+y^2}{x^2-y^2}$ is- [BB AD 22, Combined 9 Banks SO 23(2020 based)]

A. $-\frac{10}{9}$ B. $\frac{5}{4}$ C. $-\frac{5}{3}$ D. $-\frac{5}{4}$ **Ans: D**

Explanation:

Given that,

$\frac{x}{y} = \frac{1}{3}$

Or, $\frac{x^2}{y^2} = \frac{1}{9}$ [Square both sides]

Or, $\frac{x^2+y^2}{x^2-y^2} = \frac{1+9}{1-9}$ [Componendo and Dividendo]

∴ $\frac{x^2+y^2}{x^2-y^2} = \frac{10}{-8} = -\frac{5}{4}$(**Ans.**)

182. What would be the value of 20% of m as a percentage of p, if 8% of m = 4% of p? [Combined SO 23(2021 based)]

A. 80% B. 16% C. 10% D. None **Ans: C**

Explanation:

8% of m = 4% of p

Or, 2% of m = 1% of p

∴ 20% of m = 10% of p

Ans: 10%

183. The perimeters of two squares are 40 cm and 32 cm. Find the perimeter of a third square whose area is equal to the difference of the areas of the two squares. [Combined SO 23(2021 based)]

A. 18 cm B. 24 cm C. 32 cm D. 36 cm **Ans: B**

Explanation:

One side of the 1st square = $\frac{40}{4}$ = 10 cm and one side of 2nd square = $\frac{32}{4}$ = 8 cm

∴ Area of the third square = $(10)^2 - (8)^2 = 100 - 64 = 36$ sq.cm.

∴ One side of the 3rd square = $\sqrt{36} = 6$ cm

∴ Perimeter of the 3rd square = 4×6 = 24 cm. (**Ans.**)

184. A rectangular sheet of paper, 10 cm long and 8 cm wide has squares of side 2 cm cut from each of its corner. The sheet is then folded to form a tray of depth 2cm. What is the volume of this tray? [Combined SO 23(2021 based)]

A. 32 cm^3 B. 48 cm^3 C. 49 cm^3 D. 54 cm^3 **Ans: B**

Explanation:

Length = 10-(2×2) = 6 cm, width = 8-(2×2) = 4 cm and height = 2 cm

∴ Volume = 6×4×2 = 48 cm^3 (**Ans.**)

185. If a + b + c = 0, then the value of $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$ is- [Combined SO 23(2021 based)]

A. 3abc B. $\frac{1}{3}$ C. 1 D. 3 **Ans: D**

Explanation:

Given that,

a+ b+ c = 0

Or, a+ b = -c

Or, $(a+b)^3 = (-c)^3$ [Cube on both sides]

Or, $a^3 + 3ab(a+b) + b^3 = -c^3$

Or, $a^3 + 3ab(-c) + b^3 = -c^3$ [∵ a+b = -c]

Or, $a^3 - 3abc + b^3 = -c^3$

∴ $a^3+b^3+c^3 = 3abc$

Now,

$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = \frac{a^3+b^3+c^3}{abc} = \frac{3abc}{abc} = 3$ (**Ans.**)

186. The value of $\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}$ is: [BB AD 14, Rupali SO 19, Combined SO 23(2021 based)]

A. 6 B. 4 C. 2 D. 1 **Ans: B**

Explanation:

$\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}} = \sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + 15}}}} = \sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{169}}}}$

$= \sqrt{10 + \sqrt{25 + \sqrt{108 + 13}}} = \sqrt{10 + \sqrt{25 + \sqrt{121}}} = \sqrt{10 + \sqrt{25 + 11}} = \sqrt{10 + \sqrt{36}} = \sqrt{10 + 6} = \sqrt{16} = 4$ (**Ans.**)

187. 3 years ago, the average age of a family of 5 members was 17 years. With the birth of a new baby, the average remains the same even today. Find the age of the baby. [Janata EO(Afternoon) 17, NRBC PO/TAO 23]

A. 1 year B. 2 years C. 2.5 years D. 3 years **Ans: B**

Explanation:

Total age of 6 members = 17×6 = 102 and total age of 5 members = (17+3)×5 = 100

∴ Age of the baby = (102-100) years = 2 years. (**Ans.**)

188. $y + [y - (x + y) - \{y - (y - x - y)\} + 2x] = ?$ [NRBC PO/TAO 23]

A. 0 B. x C. 4x D. 2x **Ans: A**

Explanation:

$y + [y - (x + y) - \{y - (y - x - y)\} + 2x]$

$= y + [y - (x + y) - \{y - y + x + y\} + 2x]$

$= y + [y - (x + y) - \{x + y\} + 2x] = y + [y - x - y - x - y + 2x] = y + [-y] = y - y = 0$ (**Ans.**)

189. A car parking charges n take for the first hour, and m paisa for every additional hour. What amount it will charge if a car stayed for 5 hours? [NRBC PO/TAO 23]

A. n + 5m B. m + 5n C. m + 4n D. n + 4m **Ans: D**

Explanation:

1st hour charge = n, remaining 4 hours charge = 4m.

∴ Total charges = n + 4m (**Ans.**)

190. In a set of three numbers, the average of first two numbers is 2, the average of the last two numbers is 3, and the average of the first and the last numbers is 4. What is the average of three numbers? [Combined SO 23(2021 based)]

A. 3 B. 2 C. 2.5 D. 3.5 **Ans: A**

Explanation:

As per question,

$1^{st} + 2^{nd} = 2 \times 2 = 4$….(i) $2^{nd} + 3^{rd} = 3 \times 2 = 6$…..(ii) $1^{st} + 3^{rd} = 4 \times 2 = 8$…..(iii)

(i) + (ii) + (iii)=>

$2(1^{st} + 2^{nd} + 3^{rd}) = 4 + 6 + 8$

Or, $1^{st} + 2^{nd} + 3^{rd} = \frac{18}{2} = 9$

∴ Average = $\frac{1st+2nd+3rd}{3} = \frac{9}{3} = 3$(**Ans.**)

191. The difference between two numbers is 7 and their product is 60, then one of the two numbers must be- [NRBC PO/TAO 23]

A. 4 B. 5 C. 6 D. 7 **Ans: B**

Explanation:

Let, two numbers be x and y. (x>y)

1st condition, 2nd condition,

$x - y = 7$……(i) $xy = 60$ ∴ $x = \frac{60}{y}$…..(ii)

Putting the value of x in equation (i)

$\frac{60}{y} - y = 7$

Or, $\frac{60 - y^2}{y} = 7$

Or, $7y = 60 - y^2$

Or, $y^2 + 7y - 60 = 0$

Or, $y^2 + 12y - 5y - 60 = 0$

Or, $y(y + 12) - 5(y + 12) = 0$

Or, $(y + 12)(y - 5) = 0$

∴ $y = 5$ [$y \neq -12$, not acceptable]

Putting the value of y in equation (ii)

∴ $x = \frac{60}{5} = 12$

∴ One of the two number = 5(**Ans.**)

192. The total salary of X, Y and Z is Tk. 90,000. X earns twice of what Z earns, and Y earns 1.5 times of what Z earns. What is the salary of Z? [Combined 7 Banks Cash 23(2020 based)]

A. Tk. 15000 B. Tk. 20000 C. Tk. 25000 D. Tk. 30000 **Ans: B**

Explanation:

Given that, salary of X = 2Z and salary of Y = 1.5Z

As per question,

X+ Y+ Z = 90,000

Or, 2Z + 1.5Z + Z = 90000

Or, 4.5Z = 90000

∴ $Z = \frac{90000}{4.5} = 20000$

∴ The salary of Z = Tk. 20000(**Ans.**)

193. Reena bought some chocolates to distribute to her friends. If she gives 3 chocolates to each friend, one friend will get only 2 chocolates. Also, if she gives 2 chocolates to each friend, she will be left with 15 chocolates. How many chocolates did she buy? [NRBC PO/TAO 23]

A. 47 B. 44 C. 50 D. 35 **Ans: A**

Explanation:

Let, the total number of friends be x.

As per question,

$3(x-1) + 2 = 2x + 15$ [Number of chocolates]

Or, $3x - 3 + 2 = 2x + 15$

Or, $3x - 1 = 2x + 15$ Or, $3x - 2x = 15 + 1$ $\therefore x = 16$

$\therefore$ The number of chocolate = $3(16-1) + 2 = 47$ (**Ans.**)

194. In a survey of people owing cars or TV's it was revealed that 6% of those surveyed owned a car and 48% of those surveyed owned a TV. If 5% owned both a car and a TV, what percent of them owned neither a car nor a TV? [NRBC PO/TAO 23]

A. 42% B. 54% C. 51% D. 49% **Ans: C**

Explanation:

Total = All single –Both + None

100% = 6% + 48% - 5% + None

Or, 100% = 54% - 5% + None

$\therefore$ None = 100% - 49% = 51% (**Ans.**)

195. A boat sailing against a stream of river tanks 6 hours to travel 24 km, while sailing with the stream it takes 4 hours to travel the same distance. What is the speed of the stream? [BASIC Bank AM 18, NRBC PO/TAO 23]

A. 2.5km/hr B. 1.5km/hr C. 1 km/hr D. 0.5 km/hr **Ans: C**

Explanation: (Written)

Boat sailing against the stream = 24/6 = 4 km/h

and sailing with the stream = 24/4 = 6 km/h.

We know,
The speed of the stream
$= \frac{\text{Downstream speed} - \text{Upstream speed}}{2} = \frac{6-4}{2} = 1$ km/h

Boat's speed+ stream's speed = 6 km/h

Boat's speed- stream's speed = 4 km/h

$2 \times$ stream's speed = 6-4 = 2 km/h [By subtracting]

$\therefore$ stream's speed = 2/2 = 1 km/h.

$\therefore$ Speed of the stream = 1 km/h(**Ans.**)

Alternative Method:

Let, speed of the stream = x km/h and speed of the boat = y km/h

1st condition,

$6(y-x) = 24$ $\therefore y-x = 4$ -------- (i)

2nd condition,

$4(y+x) = 24$ $\therefore y+x = 6$ -------- (ii)

Now, (ii)- (i) =>

$2x = 2$ $\therefore x = 1$

$\therefore$ Speed of the stream = 1 kmph(**Ans.**)

196. What percent of 700 is 2.1? [Combined 7 Banks Cash 23(2020 based)]

A. 3 B. 0.3 C. 0.03 D. 30 **Ans: B**

Explanation:

Let, the required percentage be x%.

As per question,

x% of 700 = 2.1

Or, $\frac{x}{100} \times 700 = 2.1$ Or, $7x = 2.1$ $\therefore x = \frac{2.1}{7} = 0.3$ (**Ans.**)

197. If $(2x - 1)^2 = 100$ then which one of the following could equal x? [Combined 7 Banks Cash 23(2020 based)]

A. $-\frac{11}{2}$ B. $-\frac{9}{2}$ C. $\frac{11}{2}$ D. $\frac{13}{2}$ **Ans: C**

Explanation:

$(2x - 1)^2 = 100$

Or, $2x - 1 = \sqrt{100} = 10$ Or, $2x = 10 + 1 = 11$ $\therefore x = \frac{11}{2}$ (**Ans.**)

198. If the product of three consecutive integers is 720, then the sum of the two largest integers is- [Combined 7 Banks Cash 23(2020 based)]

A. 10 B. 15 C. 17 D. 19 **Ans: D**

Explanation:

2 | 720
2 | 360
2 | 180
2 | 90
3 | 45
3 | 15
5

∴ 720 = 2×2×2×2×3×3×5 = (2×2×2)×(3×3)×(5×2) = 8×9×10
∴ The consecutive integers are 8, 9 and 10.
∴ The sum of the two largest integers = 9 + 10 = 19(**Ans.**)

199. Nafiza bought a ticket of a cricket match for Tk. 25 and later sold the ticket to Raida for Tk. 75. What was the percent increase in the price of the ticket? [Combined 7 Banks Cash 23(2020 based)]

A. 200% B. 150% C. 300% D. 100% **Ans: A**

Explanation:

Cost price = Tk. 25 and selling price = Tk. 75
∴ Profit percentage = $\frac{Selling\ price - Cost\ price}{Cost\ price} \times 100\% = \frac{75-25}{25} \times 100\% = \frac{50}{25} \times 100\% = 200\%$ (**Ans.**)

200. A is 3 years older than B and 3 years younger than C. B and D are twins. How older is C than D? [Combined 7 Banks Cash 23(2020 based)]

A. 12 years B. 6 years C. 3 years D. Cannot be Determined **Ans: B**

Explanation:

Let, B's age be x years. So, A's age = x +3 and C's age = x + 3 + 3
Given that, B and D are twins. So, D's age = x years.
∴ C is older than D, C – D = x + 3 + 3 – x = 6 years. (**Ans.**)

201. A glass when full of milk, weighs 1 kg. It weighs 0.75 kg when the glass is half full. What is weight of the empty glass? [Combined 7 Banks Cash 23(2020 based)]

A. 0.25 kg B. 0.35 kg C. 0.40 kg D. 0.50 kg **Ans: C**

Explanation:

As per question,
$\frac{1}{2}$ of its capacity = (1-0.75) kg = 0.25 kg
∴ Full capacity = (2×0.25) kg = 0.50 kg.
∴ Weight of the empty glass = (1- 0.50) kg = 0.50 kg. (**Ans.**)

202. A man's age is now 3 times his son's age. Eight years back, the man's age was 5 times his son's age. What is the present age of the son? [Combined 7 Banks Cash 23(2020 based)]

A. 15 B. 20 C. 18 D. 16 **Ans: D**

Explanation:

Let, present age of son be x years. So, father's age = 3x years.
As per question,
3x - 8 = 5(x - 8) [8 years ago]
Or, 3x - 8 = 5x – 40 Or, 5x- 3x = 40 – 8 Or, 2x = 32 ∴ x = $\frac{32}{2}$ = 16
∴ Present age of son = 16 years. (**Ans.**)

203. Of 30 applicants for a job. 14 had at least 4 years' experience, 18 had degrees, and 3 had less than 4 years' experience and did not have a degree. How many of the applicants had at least 4 years' experience and a degree? [Agrani SO 13, Midland TAO 15, BKB SO 17, Combined 7 Banks Cash 23(2020 based)]

A. 13 B. 9 C. 5 D. 7 **Ans: C**

Explanation:

Total = All single –Both + None
30 = 14 + 18 - Both + 3
∴ Both = 35- 30 = 5 (**Ans.**)

162. M is a girl and has the same number of brothers as sisters. N is a boy and has twice as many sisters as brothers. M and N are the children of Q. How many children does Q have? [Standard bank MTO 16, Combined 9 Banks SO 23(2020 based)]

A. 2 B. 3 C. 5 D. 7 **Ans: D**

Explanation:

Let, number of boys be x and girls be y.

1st condition, $y - 1 = x$ …..(i)

2nd condition, $2(x - 1) = y$ …..(ii)

Putting the value of y from equation (ii) into equation (i)

$2(x - 1) - 1 = x$

Or, $2x - 2 - 1 = x$ Or, $2x - x = 3$ $\therefore x = 3$

Putting the value of x in equation(ii)

$2(3-1) = y$ $\therefore y = 4$

$\therefore$ The number of children = 3 + 4 = 7 (**Ans.**)

163. A, B, C, D and E are 5 consecutive numbers in increasing order, deleting one of them from the set decreased the sum of the remaining numbers by 20% of the sum of 5. Which one of the number is deleted from the set? [Combined SO 23(2021 based)]

অনুবাদঃ

৫টি ক্রমিক সংখ্যা **A, B, C, D ও E**। এদের মধ্যে একটি সংখ্যা বাদ দিলে বাকিগুলোর সমষ্টি, মোট ৫টি সংখ্যার সমষ্টি থেকে ২০% হ্রাস পায়। কোন সংখ্যাটিকে বাদ দেয়া হয়, তা নির্ণয় কর।

A. B B. A C. D D. C **Ans: C**

Explanation:

Let, the consecutive numbers are 1, 1+1 = 2, 1+2 = 3, 1+3 = 4 & 1+4 = 5

So, total = 1+2+3+4+5 = 15

Deleting 1 of the 5 numbers from the set, then decreased 20% of the sum.

20% of the sum = 20% of 15 = 3

So, the deleted number is the 3rd from the set and that is 'C'. (**Ans.**)

Alternative method: (Written method)

Let, A = x

As the series is increasing in order of size.

So, B = x+1, C = x+2, D = x+3, E = x+4.

Therefore, the sum of five consecutive numbers is x+ x+1+ x+2+ x+3+ x+4 = 5x+10

Again, let the deleted number is Y.

According to question,

$(5x+10)-(5x+10-Y) = 20\%$ of $(5x+10)$

Or, $5x+10-5x-10+Y = (5x+10)\times\frac{20}{100}$ $\therefore Y = (5x+10)\times\frac{1}{5} = x+2$

So, the deleted number is (x+2),

$\therefore$ This is the value of "C".(**Ans.**)

164. In a class, 120 students are male and 100 students are female. 25% of the male students and 20% of the female students are engineering students. 20% of the male engineering students and 25% of the female engineering students passed the final exam. What percentage of engineering students passed the exam? [Combined 9 Banks SO 23(2020 based)]

A. 10% B. 16% C. 22% D. 25% **Ans: C**

Explanation:

Total Engineering students = 25% of 120 + 20% of 100 = 30 + 20 = 50

Total Engineering students passed = 20% of 30 + 25% of 20 = 6 + 5 = 11

$\therefore$ The percentage of engineering students passed the exam = $\frac{11}{50}\times 100\% = 22\%$ (**Ans.**)

165. Ruby's height is 5'2". Ana is taller than Ruby but she is not taller than Pamela. Pamela is shorter than her cousin Rony but she is not shorter than Ruby. Who is the tallest in the group? [Combined 9 Banks SO 23(2020 based)]

A. Ana B. Rony C. Pamela D. Ruby **Ans: B**

Explanation:

1st condition, Pamela> Ana> Ruby

2nd condition, Rony> Pamela>Ruby

$\therefore$ From 2 condition, we can write, Rony> Pamela>Ana> Ruby

$\therefore$ The tallest in the group is Rony. (**Ans.**)

166. What is the total sum of all the interior angles of parallelogram? [Combined 8 Banks Officer 22, Combined 9 Banks SO 23(2020 based)]

A. 180^0 B. 240^0 C. 360^0 D. 540^0 **Ans: C**

Explanation:

Sum of the interior angles of parallelogram is 360^0

Note: The opposite angles of a parallelogram are equal.

Consecutive angles of a parallelogram are supplementary.

167. The average weight of A, B, C is 45 Kg. The average weight of A and B be 40Kg and that of B, C be 43Kg. Find the weight of B. [Combined 9 Banks Officer 23(2020 based)]

অনুবাদঃ

A, B ও C এর গড় ওজন 45Kg। A ও B এর গড় ওজন 40Kg এবং B ও C এর গড় ওজন 43Kg, B এর ওজন নির্ণয় কর।

A. 17 kg B. 31 kg C. 20 kg D. None of these **Ans: B**

Explanation:

Let, A, B, C represent their individual weights.

Given that,

A+B+C = (45×3) Kg = 135 Kg ….(i)

A+B = (40×2) Kg = 80 Kg ……. (ii)

B+C = (43×2) Kg = 86 Kg ……(iii)

Now, (ii) + (iii) – (i) =>

(A+B) + (B+C) – (A+B+C) = 80+86-135 ∴ B = 31 kg

∴ The weight of B = 31 kg.(**Ans.**)

168. The area of the floor of auditorium is 600 sq. m. How many unbroken tiles of dimension 10×30 cm^2 will be required to cover the floor completely? [Combined 9 Banks SO 23(2020 based)]

A. 200 B. 1500 C. 1000 D. 20000 **Ans: D**

Explanation:

The area of the floor = 600 sq. m = (600×10,000) cm^2

Area of the tiles = (10×30) cm^2 = 300 cm^2

∴ The required number of tiles = $\frac{600\times10,000}{300}$ = 20,000 (**Ans.**)

169. Bowl S contains only marbles. If $\frac{1}{4}$ of the marbles were removed, the bowl would be filled to $\frac{1}{2}$ of its capacity. If 100 marbles were added, the bowl would be full. How many marbles are in bowl S? [Combined SO 23(2021 based)]

A. 100 B. 200 C. 250 D. 300 **Ans: B**

Explanation:

Let, the number of marbles in bowl S be x.

As per question,

$x = \frac{1}{2}$ of x + 100

Or, $x - \frac{x}{2} = 100$ Or, $\frac{x}{2} = 100$ ∴ x = 200

∴ The number of marbles in bowl S = 200. (**Ans.**)

Shortcut:

As per question,

$\frac{1}{2}$ of its capacity = 100 marbles

∴ Full capacity = 2×100 = 200 marbles (**Ans.**)

170. Point A is 10 km west of point B. Point B is 30 km north of point C. Point C is 20 km east of point D. What is the distance between point A and D? [Combined SO 23(2021 based)]

A. $10\sqrt{20}$ B. $10\sqrt{10}$ C. $20\sqrt{10}$ D. $30\sqrt{10}$ **Ans: B**

Explanation:

According to Pythagoras theorem,

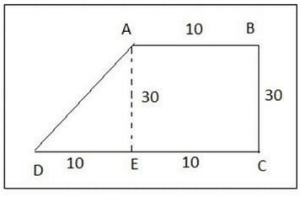
$AD^2 = AE^2 + DE^2$

Or, $AD^2 = 30^2 + 10^2 = 1000$

Or, $AD = \sqrt{1000}$

∴ $AD = \sqrt{100 \times 10} = 10\sqrt{10}$

∴ The distance between point A and D = $10\sqrt{10}$ km (**Ans.**)



171. What is the difference between the amount of interest earned on a principal of Tk. 100 for 2 years at 10% simple interest rate and 10% compounding interest rate? [Combined SO 23(2021 based)]

A. Tk. 121 B. Tk. 120 C. Tk. 2 D. Tk. 1 **Ans: D**

Explanation:

Given that, P = 100; n = 2 years; r = 10%

Simple interest = Pnr = Tk. (100×2×10%) = Tk. 20

Compound interest = $P(1+r)^n - P = 100(1+10\%)^2 - 100$ = Tk. (121 - 100) = Tk. 21

∴ Difference = Tk. (21- 20) = Tk. 1 (**Ans.**)

172. If $0< x \leq 1$, which one of the following is the maximum value of $(x-1)^2 + x$? [Combined 3 Banks AE(IT) 20, Combined SO 23(2021 based)]

A. – 1 B. – 2 C. 0 D. 1 **Ans: D**

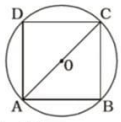
Explanation:

Given that, $0<x\leq1$ অর্থাৎ x এর মান শুন্য থেকে বড় এবং ১ এর সমান বা ১ থেকে ছোট। সুতরাং x এর মান ০ বা ১ থেকে বড় হবে না।

প্রদত্ত সমীকরণে x এর সর্বোচ্চ মান ১ বসালে, সমীকরণের সর্বোচ্চ মান পাওয়া যাবে।

∴ $(x-1)^2 + x = x^2 - 2x + 1 - x = x^2 - x + 1 = 1^2 - 1 + 1 = 1$(**Ans.**)

173. Square ABCD is inscribed in a circle, whose radius is 4cm. Calculate the area of the square. [Combined SO 23(2021 based)]



A. 16 B. 32 C. 48 D. None **Ans: B**

Explanation:

Radius r = 4cm. So, 2r = 8cm

Let, one side of the square be 'a' cm.

As per question,

$\sqrt{2}a = 8$

∴ $a = \frac{8}{\sqrt{2}} = \frac{2\times\sqrt{2}\times\sqrt{2}}{\sqrt{2}} = 2\sqrt{2}$

∴ Area of the square = $a^2 = (2\sqrt{2})^2 = 32$ sq. cm (**Ans.**)

174. There are 3 doors to a lecture room. In how many ways can a lecturer enter the room from one door and leave from another door? [Combined SO 23(2021 based)]

A. 1 B. 3 C. 6 D. 9 **Ans: C**

Explanation:

কক্ষে ৩টি ভিন্ন দরজা দিয়ে প্রবেশ করতে পারবে কিন্তু যে দরজা দিয়ে প্রবেশ করেছে ঐ দরজা বাদে বাকি ২টি দরজা দিয়ে বের হতে পারবে। সুতরাং নির্ণেয় সংখ্যা = ৩×২ = ২০(**Ans.**)

175. A rhombus is a quadrilateral- [Combined SO 23(2021 based)]

A. Whose all sides are equal B. Whose any two opposite sides are parallel

C. Whose all sides are equal and four angels are equal to 90° D. Both A & B **Ans: D**

Explanation:

The four properties of a Rhombus:

- ⇨ Opposite angles are equal
- ⇨ All sides are equal and, opposite sides are parallel to each other
- ⇨ Diagonals bisect each other perpendicularly
- ⇨ Sum of any two adjacent angles is 180°

Properties of quadrilaterals	Rectangle	Square	Parallelogram	Rhombus	Trapezium
All sides are equal	No	Yes	No	Yes	No
Opposite sides are equal	Yes	Yes	Yes	Yes	No
Opposite sides are parallel	Yes	Yes	Yes	Yes	Yes
All angles are equal	Yes	Yes	No	No	No
Opposite angles are equal	Yes	Yes	Yes	Yes	No
Sum of two adjacent angles is 180	Yes	Yes	Yes	Yes	No
Bisect each other	Yes	Yes	Yes	Yes	No
Bisect perpendicularly	No	Yes	No	Yes	No

176. For a research purpose 2500 individuals were interviewed. Among them 750 persons have bank accounts in State Owned Commercial Banks (SOCBS) and 2250 persons have bank accounts in Private Commercial Banks (PCBs). How many of them have bank accounts in both SOCBS and PCBs? [Combined SO 23(2021 based)]

A. 250 B. 300 C. 500 D. 600 **Ans: C**

Explanation:

∴ Both = All single – Total = 750 + 2250 – 2500 = 3000 – 2500 = 500 (**Ans.**)

177. Which is the larger between two numbers if they are in the ratio of 6: 13 and their least common multiple is 312? [Combined SO 23(2021 based)]

A. 52 B. 26 C. 24 D. 12 **Ans: A**

Explanation:

Let, HCF be X. So, LCM = X×6×13 = 78x

As per question,

78X = 312

∴ $X = \frac{312}{78} = 4$

∴ Larger number = 13×4 = 52 (**Ans.**)

178. Three coins are tossed. Find the probability of exactly 2 heads- [Combined SO 23(2021 based)]

A. $\frac{3}{8}$ B. $\frac{1}{2}$ C. $\frac{1}{8}$ D. None **Ans: A**

Explanation:

Total outcome = 2×2×2 = 8

From sample space we get THH, HHT and HTH.

So, number of favorable outcomes = 3

∴ Required Probability = $\frac{\text{Favorable outcomes}}{\text{Total outcomes}} = \frac{3}{8}$ (**Ans.**)

179. A group of 20 friends formed and investment club, with each member contributing an equal amount to the general fund. The club then invested the entire fund, which amounted to t taka, in stock X. The value of the stock subsequently increased 40 percent, at that point the stock was sold and the proceeds divided evenly among the members. In terms of t, how much money did each member of the club receive from the sale? [Combined SO 23(2021 based)]

A. 800t B. $\frac{t}{2}$ C. $\frac{7t}{5}$ D. $\frac{7t}{100}$ **Ans: D**

Explanation:

After 40% increase, total value = 140% of t = $\frac{140t}{100} = \frac{7t}{5}$

∴ Each of 20 friends received = $\frac{\frac{7t}{5}}{20} = \frac{7t}{100}$ (**Ans.**)

180. A machine is sold at a profit of 10%. Had it been sold for Tk. 40 less, there would have been a loss of 10%. What was the cost price? [Combined SO 23(2021 based)]

A. Tk. 175 B. Tk. 200 C. Tk. 225 D. Tk. 250 **Ans: B**

Explanation:

As per question,

20% = 40 [10% profit & 10% loss = percentage difference 20%]

∴ $1\% = \frac{40}{20}$

∴ $100\% = \frac{40\times100}{20} = 200$

∴ The cost price = Tk. 200(**Ans.**)

181. A train crossed a platform in 45 seconds travelling with a speed of 36 km/h. If the length of train is 200 meters, then what will be the length (in meters) of the platform? [Combined SO 23(2021 based)]

A. 250 B. 200 C. 300 D. 350 **Ans: A**

Explanation:

Speed of the train = 54 km/h = $54\times\frac{5}{18}$ m/s = 15 m/s. [km/h কে m/s এ রূপান্তর করে নিবেন]

Let, length of the platform be x meters.

As per question,

x+ 200 = 45×10 [Length of Platform + Train = Speed× Time]

∴ x = 450- 200 = 250

∴ The length of the platform = 250 meters.(**Ans.**)

204. Mr. Khan's salary is Tk. 5000.00 and he gets 10% commission of his salary. If his salary increased by 10%, by what percent his commission will increase? [Combined 7 Banks Cash 23(2020 based)]

A. 5% B. 10% C. 20% D. 25% **Ans: B**

Explanation:

কমিশনের পরিমাণ বেতনের উপর নির্ভরশীল তাই বেতন ১০% বৃদ্ধি পেলে কমিশনও একই পরিমাণ অর্থাৎ ১০% বৃদ্ধি পাবে।

205. If 5 students run a mile in 5 minutes, how much time will 50 students take to run a mile? [Combined 7 Banks Cash 23(2020 based)]

A. 5 min B. 10 min C. 50 min D. None of these **Ans: A**

Explanation:

৫ জন শিক্ষার্থীর ১ মাইল অতিক্রম করতে যে সময় লাগে, ৫০ জনেরও একই সময় লাগবে। দূরত্ব অতিক্রম করার সময় ব্যক্তি বৃদ্ধি পেলেও সময় কমবে না। তবে কোন কাজ করার ক্ষেত্রে ব্যক্তি যত বৃদ্ধি পাবে কাজ করতে তত কম সময় লাগবে।

206. How many numbers from 11 to 50 are there which are exactly divisible by 7 not by 3? [Combined 7 Banks Cash 23(2020 based)]

A. 6 B. 5 C. 4 D. 2 **Ans: C**

Explanation:

The numbers are 14,28,35,49 which are divisible by 7, not by 3. So, there are 4 numbers. (**Ans.**)

207. The ratio of the angles of a triangle is 2: 3: 4. What is the largest angle in degrees? [Combined 7 Banks Cash 23(2020 based)]

A. 30 B. 60 C. 80 D. 90 **Ans: C**

Explanation:

Let, three angles be 2x, 3x and 4x.

As per question,

$2x + 3x + 4x = 180^0$

Or, $9x = 180^0$ $\therefore x = 20^0$

$\therefore$ The largest angle $= 4\times20^0 = 80^0$ (**Ans.**)

208. If a square region has area n, what is the length of the diagonal of the square in terms of n? [Combined 7 Banks Cash 23(2020 based)]

A. $\sqrt{2n}$ B. $\sqrt{n}$ C. $2\sqrt{n}$ D. 2n **Ans: A**

Explanation:

Given that, area of the square = n

One side = $\sqrt{n}$

$\therefore$ Diagonal = $\sqrt{2}\times$one side = $\sqrt{2}\times\sqrt{n} = \sqrt{2n}$ (**Ans.**)

209. 10 minutes after a plane leaves the airport; it is reported to be 40 miles away. What average speed in miles per hour of the plane? [Shahjalal TSO 16, Combined 7 Banks Cash 23(2020 based)]

A. 560 B. 660 C. 200 D. 240 **Ans: D**

Explanation:

$\therefore$ Average speed $= \frac{40}{\frac{1}{6}} = 40\times6 = 240$ mph (**Ans.**) [10 min $= \frac{10}{60}$ h $= \frac{1}{6}$ h]

210. A cake is divided into 18 pieces. If Rehana takes $\frac{1}{3}$ of the cake and Rashed takes $\frac{1}{3}$ of the cake left, how many pieces are left? [NRBC PO/TAO 23, Combined 7 Banks Cash 23(2020 based)]

A. 8 B. 6 C. 4 D. 10 **Ans: A**

Explanation:

Rehana took $= \frac{18}{3} = 6$ pieces.

$\therefore$ Remaining = (18-6) = 12 pieces

Rashed took $= \frac{12}{3} = 4$ pieces

$\therefore$ Finally left = (12-4) = 8 pieces. (**Ans.**)

211. How many pieces of 85 cm length stick can be cut from a 42.5 meters long stick? [Combined 7 Banks Cash 23(2020 based)]

A. 30 B. 40 C. 50 D. 60 **Ans: C**

Explanation:

Here, 42.5 m = (42.5×100) cm = 4250 cm

$\therefore$ The required number $= \frac{4250}{85} = 50$ piece (**Ans.**)

212. How much would I have to pay for a book which cost Tk. 70 to produce, if the printing company sold it to a book seller at 20% profit and the book seller sold it to me at a profit of 25%? [Combined 7 Banks Cash 23(2020 based), NRBC PO/TAO 23]

A. Tk. 90 B. Tk. 95 C. Tk. 105 D. Tk. 110 **Ans: C**

Explanation:

Cost of production = Tk. 70

At 20% profit, Retailer cost price = Tk. 70 + 20% of Tk. 70 = Tk. 84

∴ Retailer selling price = 125% of Tk. 84 = Tk. 105(**Ans.**)

213. In a T-20 cricket match, the number of boundaries scored was twice the number of over boundaries by a team. The team took 22 single runs, no two or three runs and could not score from 38 deliveries. How many runs did the team score? [NRBC PO/TAO 23]

A. 124 B. 144 C. 150 D. 302 **Ans: D**

Explanation:

Given that, boundaries: over boundaries = 2: 1

Total boundaries and over boundaries = 120- 22 – 38 = 60

Boundaries = $60\times\frac{2}{2+1}$ = 40 and over boundaries = 60- 40 = 20

∴ Total runs = 22×1 + 40×4 + 20×6 = 22 + 160 + 120 = 302 (**Ans.**)

214. A, B and C are boxes containing marbles in the ratio of 1: 2: 3. Total number of marbles is 60. The above ratio can be changed to 3: 4: 5 by transferring- [NRBC PO/TAO 23]

A. 2 marbles from A to B B. 3 marbles from B to C

C. 4 marbles from C to B D. 5 marbles from C to A **Ans: D**

Explanation:

Let, A = 10, B = 20, C = 30

If 5 marbles are transferring from C to A. So, A = 10 + 5 = 15, B = 20 and C = 30- 5 = 25

∴ A: B: C = 15: 20: 25 = 3: 4: 5

So, option D is the right answer.

215. Two people were hired to clear a lawn for total of Tk. 450. They completed the job with one person working for 1 hour 20 minutes and the other working for 40 minutes. If they split the wage in proportion to the amount of time each spent working on the job, how much did the person who worked longer receive? [NRBC PO/TAO 23]

A. Tk. 225 B. Tk. 300 C. Tk. 250 D. Tk. 275 **Ans: B**

Explanation:

Working time ratio = 80 min: 40 min = 2: 1

∴ The person who worked longer get = Tk. $(\frac{2}{2+1}\times 450)$ = Tk. 300 (**Ans.**)

216. Sohana's mathematics test had 75 problems i.e. 10 arithmetic, 30 algebra and 35 geometry problems each carrying I mark She answered 70% of the arithmetic, 40% of the algebra and 60% of the geometry problems correctly. She did not pass the test as she got less than 60% marks. How many more questions she would have needed to answer correctly to earn a 60% passing grade? [NRBC PO/TAO 23]

A. 5 B. 10 C. 15 D. 20 **Ans: A**

Explanation:

Total correct answer = 70% of 10 + 40% of 30 + 60% of 35 = 7 + 12 + 21 = 40

∴ Required more questions to correct = 60% of 75 – 40 = 45- 40 = 5(**Ans.**)

217. In a group of 5 men, no two men have the same age. The eldest man is 50 years old and the youngest is 30 years old. If X years is the average age of the men in the group, which of the following best indicates all and only possible values of X? (All ages are in whole numbers) [NRBC PO/TAO 23]

A. 30 < X < 50 B. 31 < x < 49

C. 35 < x < 45 D. 33 < x < 46 **Ans: C**

Explanation:

When maximum age, then the ages could be 30, 47, 48, 49 and 50.

So, maximum average = $\frac{30+47+48+49+50}{5}$ = 44.8

When minimum age, then the ages could be 30, 31, 32, 33 and 50.

So, minimum average = $\frac{30+31+32+33+50}{5}$ = 35.2

∴ Possible values of x, 35<x<45 (**Ans.**)

218. The length of the side of an equilateral triangle is 6 cm. What is its area in sq. cm? [NRBC PO/TAO 23, Premier MTO 23]

A. $3\sqrt{3}$ B. $4\sqrt{3}$ C. $6\sqrt{3}$ D. $9\sqrt{3}$ **Ans: D**

Explanation:

$\therefore$ Area of the equilateral triangle $= \frac{\sqrt{3}}{4}\times(\text{one side})^2 = \frac{\sqrt{3}}{4}\times(6)^2 = \frac{\sqrt{3}}{4}\times 36 = 9\sqrt{3}$(**Ans.**)

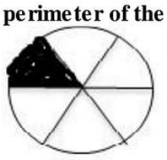
219. If the length and width of a rectangular plot were each increased by 20%, what would be the percent increase in the area of the plot? [KB SO 09, MTB PO 16, Combined 8 Banks Officer 22, Combined 7 Banks Cash 23(2020 based), NRBC PO/TAO 23]

A. 44% B. 24% C. 36% D. 20% **Ans: A**

Explanation:

$(20+ 20 + \frac{20\times 20}{100})\% = 44\%$ (**Ans.**)

220. A circle has center C. Area is 144π. The circle is divided into 6 equal parts. The perimeter of the shaded part is-[NRBC PO/TAO 23]



A. $24(1+\pi)$ B. $12(2+\pi)$ C. $4(\pi+6)$ D. $12(1+2\pi)$ **Ans: C**

Explanation:

Let, radius be r.

As per question,

$\pi r^2 = 144\pi$

Or, $r^2 = 12^2$ $\therefore$ $r = 12$

$\therefore$ Perimeter of the shaded part $= \frac{2\pi r}{6} + 2r = \frac{2\pi\times 12}{6} + 2\times 12 = 4\pi + 24 = 4(\pi+6)$ (**Ans.**)

Note: বৃত্তের নির্দিষ্ট অংশের পরিধি হবে বৃত্তের পরিধির ৬ ভাগের এক ভাগ যা বৃত্তের চাপ এবং ২ পাশের ব্যাসার্ধের যোগফল।

221. A culprit was spotted by a policeman from a distance of 250 meter. When the policeman started running towards the culprit at a speed of 10 km/h, the culprit also fled. If his speed was 8 km/h, find how far the culprit had run before he was overpowered. [NRBC PO/TAO 23]

A. 1km B. 1.5km C. 2km D. 0.8km **Ans: A**

Explanation:

Relative speed = (10-8) km = 2 km

Policeman required time to cover 250 meter Or 0.25 km $= \frac{Distance}{Speed} = \frac{0.25}{2} = \frac{25}{200} = \frac{1}{8}$ hour

$\therefore$ The culprit run distance = Speed$\times$ Time $= 8\times\frac{1}{8}$ km = 1 km(**Ans.**)

222. On a 2 km road, a total of 201 trees are planted on the side of the road at equal distance. How many such trees will be planted on a 50 km road such that the distance between two consecutive trees is the same as that of the consecutive trees on the 2 km road? [BB AD 22, Premier MTO 23]

A. 501 B. 5001 C. 5000 D. 1000 **Ans: B**

Explanation:

প্রশ্নমতে, ২ কিমি রাস্তায় সমান দূরত্বে মোট ২০১টি গাছ লাগানো আছে, ৫০ কিমি তে মোট কতটি গাছ লাগানো যাবে?

রাস্তার শুরুতেই ১টি গাছ আছে এবং বাকি অংশে মোট ২০০ টি গাছ আছে। যদি সামনে একই দূরত্বে গাছ লাগানো হয় তাহলে

২ কিমি তে ২০০ টি গাছ লাগানো যায়

৫০ কিমি তে $\frac{২০০\times ৫০}{২}$ = ৫০০০টি গাছ লাগানো যায়।

$\therefore$ মোট গাছের সংখ্যা = শুরু তে ১ টি + ৫০ কিমি তে ৫০০০ = ৫০০১টি। (**Ans.**)

223. A and B started a business jointly. A's investment was thrice the investment of B and the period of his investment was two times the period of investment of B. If B received Tk. 4000 as profit, then their total profit is: [Pubali TA Teller 17, Premier MTO 23]

A. Tk. 16,000 B. Tk. 20,000 C. Tk. 24,000 D. Tk. 28,000 **Ans: D**

Explanation:

A: B = (3×2): (1×1) = 6: 1 [Profit = Investment$\times$ Time]

Now, $\frac{B'sProfit}{Total\ Profit} = \frac{1}{6+1}$ Or, $\frac{4000}{Total\ Profit} = \frac{1}{6+1}$ $\therefore$ Total profit = Tk. 28,000 (**Ans.**)

224. A students obtained 60, 75 and 85 marks respectively in 3 monthly examinations in physics and 95 marks in the final examination. The 3 monthly examinations are of equal weightage whereas the final examination is weighted twice as much as monthly examination. What is his average mark in physics? [BB AD 22, Premier MTO 23]

A. 82 B. 85 C. 79 D. 78.75 **Ans: A**

Explanation:

$\therefore$ Average $= \frac{60\times1+75\times1+85\times1+95\times2}{1+1+1+2} = \frac{410}{5} = 82$(**Ans.**)

শেষ মাসে weighted twice তাই ৯৫ এর সাথে ২ গুণ করা হয়েছে

225. A square room has a square carpet symmetrically placed in it. This leaves an uncovered area of 9 meter^2. The area of the whole room is 25 meter^2. What is the length of the one side of the carpet? [BB AD 22, Premier MTO 23]

A. 2 meters B. 4 meters C. 6 meters D. 8 meters **Ans: B**

Explanation:

Covered area = (25 -9) m^2 = 16 m^2

$\therefore$ Length of the one side of the square carpet = $\sqrt{16}$ = 4 meters. (**Ans.**)

226. What is the smallest number of apples that can be distributed equally (without cutting any apple) among 6, 10, 14 and 18 boys? [BB AD 22, Premier MTO 23]

A. 1260 B. 315 C. 360 D. 630 **Ans: D**

Explanation:

LCM of 6, 10, 14 and 18 is the required smallest number apples.

2|6, 10, 14, 18

3|3, 5, 7, 9

1, 5, 7, 3

$\therefore$ LCM = 2×3×5×7×3 = 630 (**Ans.**)

227. A passenger paid 50% customs duty on accompanied baggage items. He paid another 20% sales tax on the total value of the items plus the custom duty paid. The total customs duty and sales tax is Tk. 350. What is the value of the item custom duty and sales tax? [BB AD 22, Premier MTO 23]

A. Tk. 400 B. Tk. 450 C. Tk. 500 D. None of these **Ans: D**

Explanation:

Let, value of the item be 100x.

After 50% customs duty, value = 100x + 50% of 100x = 150x.

After paid 20% sales tax, value = 150x + 20% of 150x = 150x + 30x = 180x

Total tax = 180x -100x = 80x

As per question,

80x = Tk. 350

$\therefore$ 100x = Tk. $\frac{350\times100}{80}$ = Tk. 437.5(**Ans.**)

228. A person's present age is two-fifth of the age of his mother. After 8 years, he will be one-half of the age of his mother. What is the present age of the mother? [Pubali SO & O 16, SIBL PO 21, BB AD 22, Premier MTO 23]

A. 30 years B. 35 years C. 40 years D. 50 years **Ans: C**

Explanation:

Let, the mother's age be x years. So, person's age = $\frac{2x}{5}$ years.

As per question,

$\frac{1}{2}(x+8) = (\frac{2x}{5}+8)$

Or, 5x + 40 = 4x + 80 [Multiplying by 10] Or, 5x-4x = 80-40 $\therefore$ x = 40(**Ans.**)

229. An article is listed at Tk. 900 and two successive discounts of 8% and 8% are given on it. How much would the seller gain or lose, if he gives a single discount of 16%, instead of two discounts? [Premier MTO 23]

A. Gain, Tk.4.76 B. Gain, Tk.5.76 C. Loss, Tk.5.76 D. Loss, Tk.4.76 **Ans: C**

Explanation:

At 1st 8% discount, selling price = 92% of Tk. 900 = Tk. 828

At 2nd 8% discount, selling price = 92% of Tk. 828 = Tk. 761.76

At 16% discount, selling price = 84% of Tk. 900 = Tk. 756

$\therefore$ Loss = Tk. (761.76 - 756) = Tk. 5.76 (**Ans.**)

230. If the numerator of a fraction is increased by 150% and the denominator of the fraction is increased by 300%, resultant fraction is $\frac{5}{18}$. What is the original fraction? [Premier MTO 23]

A. $\frac{4}{9}$ B. $\frac{4}{5}$ C. $\frac{8}{9}$ D. $\frac{8}{11}$ **Ans: A**

Explanation:

Let, the fraction be $\frac{x}{y}$

$\frac{x+150\% \text{ of } x}{y+300\% \text{ of } y} = \frac{5}{18}$

Or, $\frac{x+1.5x}{y+3y} = \frac{5}{18}$

Or, $\frac{2.5x}{4y} = \frac{5}{18}$ Or, $\frac{5x}{8y} = \frac{5}{18}$ Or, $\frac{x}{y} = \frac{5}{18} \times \frac{8}{5}$ $\therefore \frac{x}{y} = \frac{4}{9}$

$\therefore$ The fraction is $\frac{4}{9}$.(**Ans.**)

231. The larger of two numbers exceeds twice the smaller number by 9. The sum of twice the larger and 5 times the smaller number is 74. If 'a' is the smaller number, which equation below determines the correct value of 'a'? [Premier MTO 23]

A. 5(2a-9)+ 2a = 74 B. 5(2a -9)-2a = 74

C. (4a +9) -5a = 74 D. 2(2a+9) +5a = 74

Explanation:

Given that, smaller number = a. So, larger number = 2a + 9

As per question,

2(2a +9) + 5a = 74 (**Ans.**)

232. A man, his wife and daughter worked in a garden. The man worked for 3 days, his wife for 2 days and daughter for 4 days. The ratio of daily wages for man to woman is 5: 4 and the ratio for man to daughter is 5: 3. If their total earnings are amounted to Tk. 105, then find the daily wage of the daughter. [Premier MTO 23]

A. Tk. 9 B. Tk. 10 C. Tk. 12 D. Tk. 15 **Ans: A**

Explanation:

Man: Woman = 5: 4 and Man: Daughter = 5: 3

Man: Woman: Daughter = 5: 4: 3

Let, daily wages of man, woman and daughter be 5x, 4x and 3x respectively.

Total income of man = 5x×3 = 15x, woman = 4x×2 = 8x and daughter = 3x×4 = 12x

As per question,

15x + 8x + 12x = 105

Or, 35x = 105

Or, $x = \frac{105}{35} = 3$ $\therefore 3x = 3 \times 3 = 9$

$\therefore$ The daily wage of the daughter = Tk. 9 (**Ans.**)

233. If the length of a certain rectangle is decreased by 4 cm and width is increased by 3 cm, a square with the same area as the original rectangle would result. Find the perimeter of the original rectangle. [Premier MTO 23]

A. 16 cm B. 9 cm C. 144 cm D. 50 cm **Ans: D**

Explanation:

Let, the length be x cm and width be y cm.

Area = xy sq. cm

When length decreased by 4 cm, new length = x – 4 cm

When breath increased by 3 cm, new breadth = y + 3 cm

1st condition,

x -4 = y + 3

$\therefore$ x = y + 3 + 4 = y + 7 ….. (i)

2nd condition,

xy = (x-4)(y +3)

Or, xy = xy +3x – 4y – 12

Or, xy –xy = 3(y+7) -4y -12 [From equation (i)]

Or, 0 = 3y + 21 -4y -12 Or, 0 = -y + 9 $\therefore$ y = 9

Putting the value of y in equation (i)

$\therefore$ x = 9 + 7 = 16

$\therefore$ Perimeter = 2(x + y) = 2(16 + 9) = 50 cm (**Ans.**)

234. The average monthly income of a family of four earning members was Tk. 15130. One of the daughters in the family got married and left home, so the average monthly income of the family came down to Tk. 14660. What was the monthly income of the married daughter? [Premier MTO 23]

A. Tk. 12000 B. Tk. 15350 C. Tk. 16540 D. Cannot be determined **Ans: C**

Explanation:

Total monthly income of four members = Tk. (4×15130) = Tk. 60520

Total monthly income of three members = Tk. (3×14660) = Tk. 43980

∴ The monthly income of married daughter = Tk. 16540 (**Ans.**)

235. Anita had to do a multiplication. Instead of taking 35 as one of the multipliers, she took 53. As result, the product went up by 540. What is the new product? [Premier MTO 23]

A. 1050 B. 1250 C. 1440 D. 1590 **Ans: D**

Explanation:

Let, the multiplier be x.

As per question,

53x – 35x = 540

Or, 18x = 540 ∴ x = 30

∴ The new product = 53×30 = 1590 (**Ans.**)

236. If interest rate on a savings account is paid monthly at an annual rate of 6.25 percent and if the interest is not reinvested, then how many years will the total amount of interest earned equal the amount of money saved in the account? [Premier MTO 23]

A. 12 B. 16 C. 20 D. 24 **Ans: B**

Explanation:

প্রশ্নমতে, আসল ১০০ টাকা হলে ৬.২৫% হারে কত বছরে সুদ ১০০ টাকা হবে তা নির্ণয় করতে হবে।

∴ সময় = $\frac{\text{সুদ}}{\text{সুদের হার}} = \frac{১০০}{৬.২৫}$ = ১৬ বছর(**Ans.**)

237. Let A denote the area of a circular region. Which of the following denotes the circumference of that circular region? [Premier MTO 23]

A. $2\sqrt{(\pi A)}$ B. $\frac{2A}{\sqrt{\pi}}$ C. $2\pi\sqrt{A}$ D. $\frac{2\sqrt{A}}{\pi}$ **Ans: A**

Explanation:

Area, $A = \pi r^2$

Or, $r^2 = \frac{A}{\pi}$ ∴ $r = \sqrt{\frac{A}{\pi}}$

∴ Circumference = $2\pi r = 2\pi \times \sqrt{\frac{A}{\pi}} = 2\sqrt{A}\sqrt{\pi} = 2\sqrt{(\pi A)}$ (**Ans.**)

238. In a store, pens are sold for 25% less than the tag price. If a pen costs Tk. 48, what will be the tag price of the pen to make a 25% profit on its cost? [BAPEX AM 23]

A. 64 B. 72 C. 80 D. None **Ans: C**

Explanation:

Let, tag price be Tk. 100x

At 25% discount, selling price = 75% of Tk. 100x = Tk. 75x.

Selling price = 125% of Tk. 48 = Tk. 60

As per question,

75x = 60

∴ $x = \frac{60}{75}$

∴ $100x = \frac{60\times100}{75} = 80$

∴ The tag price = Tk. 80(**Ans.**)

239. A train traveled p kms in 40 minutes and completed the remaining 200 kms of the trip in q minutes. What was its average speed, in km per hour for the entire trip? [BAPEX AM 23]

A. $\frac{60(p+200)}{40+q}$ B. $\frac{240}{p+q}$ C. $\frac{4}{p+q}$ D. None **Ans: A**

Explanation:

Total distance = (p + 200) kms and total time = (40 +q) min = $\frac{40+q}{60}$ hours.

∴ Average speed = $\frac{Distance}{Time} = \frac{p+200}{\frac{40+q}{60}} = \frac{60(p+200)}{40+q}$ (**Ans.**)

240. Of the following, which is the closest to $\frac{6.01\times501}{25.05\times19.99}$? [BAPEX AM 23]

A. 6 B. 8 C. 10 D. 15 **Ans: A**

Explanation:

$\frac{6.01\times501}{25.05\times19.99} \approx \frac{6\times500}{25\times20} = 6$ **(Ans.)**

241. At 8 am two trains started traveling towards each other from stations 300 km apart. They passed each other at 12 noon, the same day. If the average speed of the faster train was 9 km more than that of the slower train, then what is the speed of the faster train in km/hr? [BAPEX AM 23]

A. 40 B. 42 C. 45 D. None **Ans: B**

Explanation:

Let, speed of faster train be x km/h and slower train be (x-9) km/h

∴ Relative speed = x + x -9 = (2x -9) km/h and time = 8am to 12 noon = 4 hours

As per question,

300 = (2x-9)×4 [Distance = Speed× Time]

Or, 300 = 8x – 36 Or, 8x = 300 + 36 = 336 ∴ $x = \frac{336}{8} = 42$

∴ The speed of faster train = 42 km/h. **(Ans.)**

242. Jashim and Imran start walking from A to B at 5 and 3 km per hour respectively. Jashim reaches B and starts back for A. How far from B will he meet Imran if the distance between A and B is 32 km? [BAPEX AM 23]

A. 6 B. 8 C. 9 D. 12 **Ans: B**

Explanation:

Total distance = 32 km, A's speed = 5km/h B's speed = 3 km/h.

At first A covers 32 km in = $\frac{Distance}{Speed} = \frac{32}{5} = 6.4$ hours.

In 6.4 hours, B covers = Speed× Time = (3×6.4) km = 19.2 km

∴ Remaining distance = (32- 19.2) km = 12.8 km and relative speed = (5 +3) = 8 km/h

∴ Time = $\frac{12.8}{8} = 1.6$ hours.

∴ In 1.6 hours Jashim covers from B = 5×1.6 = 8 km. **(Ans.)**

243. Babu bought two varieties of pulse, costing Tk. 50 and Tk. 60 per kg. each, and mixed them in some ratio. He then sold the mixture at Tk. 70 per kg., making a profit of 20 percent. What was the ratio of the mixture? [BAPEX AM 23]

A. 1: 10 B. 1: 5 C. 2: 7 D. None **Ans: B**

Explanation:

At 20% profit, selling price = Tk. 70

So, cost price = Tk. $(\frac{70}{120}\times100)$ = Tk. $\frac{175}{3}$

Let, two varieties of pulse be x kg and y kg respectively.

According to the question,

$50x + 60y = \frac{175}{3}(x+y)$

Or, 150x + 180y = 175x + 175y

Or, 180y -175y = 175x -150x

Or, 5y = 25x Or, $\frac{5}{25} = \frac{x}{y}$ ∴ x: y = 1: 5 **(Ans.)**

Alternative method:

Cost price বের না করেও নিম্নরূপ সমাধান করা যাবে।

According to the question,

120% of (50x+60y) = 70(x+y)

Or, 60x + 72y = 70x + 70y

Or, 72y – 70y = 70x -60x

Or, 2y = 10x

∴ x :y = 1:5. **(Ans.)**

244. $\frac{3}{8}$ of all applicants for a job are male. $\frac{3}{4}$ of all applicants are rejected in the first round including $\frac{2}{3}$ of all male applicants. What fraction of applicants remaining after the first round are male? [BAPEX AM 23]

A. $\frac{1}{2}$ B. $\frac{1}{4}$ C. $\frac{2}{9}$ D. None **Ans: A**

Explanation:

Let, the number of applicants be 8x.

So, the number of male applicants = $8x\times\frac{3}{8} = 3x$

The number of all rejected applicants = $8x\times\frac{3}{4} = 6x$. So, rejected male = $3x\times\frac{2}{3} = 2x$

The remaining all applicants = 8x-6x = 2x. So, remaining male applicants = 3x-2x = x

∴ Required fraction = $\frac{x}{2x} = \frac{1}{2}$ **(Ans.)**

245. There are 8 marbles in a box- 6 red and 2 black. If you randomly pick 2 marbles simultaneously what is the probability that you will get one red and 1 black marble? [BAPEX AM 23]

A. $\frac{3}{7}$ B. $\frac{3}{14}$ C. $\frac{3}{8}$ D. None **Ans: A**

Explanation:

Given that, 6 red marbles and 2 black marbles.

Total = 6+ 2 = 8

∴ The probability that one red and one black = $\frac{6C1\times2C1}{8C2} = \frac{6\times2}{28} = \frac{3}{7}$ **(Ans.)**

246. In an essay competition, a winner gets a prize of Tk. 100 and a participant who does not win gets a prize of Tk. 25. The total prize money distributed is Tk. 3,000. Find the number of winners, if the total number of participants is 63. [BAPEX AM 23]

A. 15 B. 17 C. 19 D. 21 **Ans: C**

Explanation:

Let, the number of winners be x and non-winner = 63 –x

As per question,

100x + 25(63-x) = 3000

Or, 100x + 1575 - 25x = 3000 Or, 75x = 3000-1575 = 1425 ∴ x = $\frac{1425}{75}$ = 19

∴ The number of winners = 19**(Ans.)**

247. x, y are positive integers. When x is divided by y, the remainder is 5. If $\frac{x}{y}$ = 5.20, what is the value of x? [BAPEX AM 23]

A. 130 B. 155 C. 330 D. 425 **Ans: A**

Explanation:

$\frac{x}{y}$ = 5.20

Or, $\frac{x}{y} = \frac{520}{100}$

Or, $\frac{x}{y} = \frac{130}{25}$

∴ x = 130 and y = 25(Here we have x is divided by y, the remainder is 5 and $\frac{x}{y}$ = 5.20)

∴ The value of x is 130**(Ans.)**

248. If 20% of a number is 30, what is 25% of the same number? [FSIBL PO 23]

A. 20 B. 30 C. 37.5 D. 45 **Ans: C**

Explanation:

As per question,

20% = 30

∴ 1% = $\frac{30}{20}$

∴ 25% = $\frac{30\times25}{20}$ = 37.5 **(Ans.)**

249. What is the value of 5!(5 factorial)? [FSIBL PO 23]

A. 10 B. 20 C. 60 D. 120 **Ans: D**

Explanation:

∴ 5! = 5×4×3×2×1 = 120 **(Ans.)**

250. If the radius of a circle is 6 cm, what is the area of the circle? [FSIBL PO 23]

A. 99 cm^2 B. 102 cm^2 C. 107 cm^2 D. 113 cm^2 **Ans: D**

Explanation:

Radius, r = 6 cm

∴ Area = $\pi r^2 = 3.14\times6^2 = 113.09 \approx 113$ cm^2 **(Ans.)**

251. If a box contains 15 red balls, 12 green balls and 18 blue balls, what is the probability of selecting a green ball at random? [FSIBL PO 23]

A. $\frac{1}{2}$ B. $\frac{1}{12}$ C. $\frac{6}{14}$ D. $\frac{4}{15}$ **Ans: D**

Explanation:

Total balls = 15 + 12 + 18 = 45

∴ The probability of selecting a green ball = $\frac{12}{45} = \frac{4}{15}$**(Ans.)**

252. What is the sum of the first 10 positive even integers? [FSIBL PO 23]
A. 90 B. 110 C. 65 D. 110 **Ans: D**
Explanation:
∴ Sum of the first 10 even integers = n(n +1) = 10(10 +1) = 110 (**Ans.**)

253. If a triangle has sides of lengths 5 cm, 12 cm and 13 cm, what type of triangle is it? [FSIBL PO 23]
A. Equilateral B. Scalene C. Isosceles D. Right angled **Ans: D**
Explanation:
কোন ত্রিভুজের দুটি বাহুর বর্গের যোগফল তৃতীয় বাহুর বর্গের সমান হলে ঐ ত্রিভুজকে সমকোণী ত্রিভুজ বলা হয়।
$13^2 = 5^2 + 12^2$
∴ 169 = 25 + 144 = 169
So, it is a Right angles triangle. (**Ans.**)

254. If a clock shows 3: 15, what is the measure of the angle between the hour and minute hands? [FSIBL PO 23]
A. 7.5^0 B. 15^0 C. 90^0 D. 45^0 **Ans: A**
Explanation:
H = 3 and M = 15
∴ Angle = $|\frac{11M-60H}{2}| = |\frac{11\times15-60\times3}{2}| = |\frac{165-180}{2}| = |\frac{-15}{2}| = 7.5^0$ (**Ans.**)

255. What is the largest prime number less than 100? [FSIBL PO 23]
A. 89 B. 97 C. 99 D. 95 **Ans: B**
Explanation:
∴ **97** is the largest prime number less than 100. (**Ans.**)

256. If a rectangle has a length of 15 cm and a diagonal of 17 cm, what is the area of the rectangle? [FSIBL PO 23]
A. 100 sq. cm B. 120 sq. cm C. 160 sq. cm D. 130 sq. cm **Ans: B**
Explanation:
Let, base be x cm.
As per question,
$\text{Diagonal}^2 = \text{Length}^2 + \text{Base}^2$
Or, $17^2 = 15^2 + x^2$
Or, $x^2 = 289 - 225 = 64$
∴ $x = \sqrt{64} = 8$
Breadth of the rectangle = 8 cm
∴ Area = Length× Breadth = 15×8 = 120 sq. cm (**Ans.**)

257. x^2 -(a+b)x+ ab = 0; x=? [FSIBL PO 23]
A. a, b B. a C. b D. ab **Ans: A**
Explanation:
x^2 -(a+b)x+ ab = 0
Or, x^2 – ax - bx+ ab = 0
Or, x(x -a) – b(x -a) = 0
Or, (x -a) (x -b) = 0
∴ x = a, b

258. $5a^2$ - 4a-3-3(a^2 + a + 4) = 0. What is the sum of the possible value of a? [FSIBL PO 23]
A. 3 B. 3.5 C. 4 D. 4.5 **Ans: B**
Explanation:
$5a^2$ - 4a-3-3(a^2 + a + 4) = 0
Or, $5a^2$ - 4a-3-3a^2 -3a - 12 = 0
Or, $2a^2$ -7a -15 = 0
Or, $2a^2$ -10a+3a -15 = 0
Or, 2a(a-5) + 3(a -5) = 0
Or, (a -5)(2a+3) = 0
∴ a = 5 and a = $-\frac{3}{2}$ = - 1.5
∴ The sum of the possible value of a = 5 + (-1.5) = 5 – 1.5 = 3.5 (**Ans.**)

259. A shopkeeper initially marks the price of a shirt at Tk. 80 and allows a 20% discount. If the cost price of the shirt is Tk. 60, what is the profit percentage after selling 10 such shirt? [FSIBL PO 23]

A. 26.67% B. 16.67% C. 15% D. 6.67% **Ans: D**

Explanation:

Cost price = Tk. 60 and selling price = 80% of Tk. 80 = Tk. 64

∴ Profit percentage = $\frac{64-60}{60}\times 100\%$ = 6.67% (**Ans.**)

260. A retailer bought a batch of 100 electronic gadgets for Tk. 30,000. However, during transportation, 10% of them got damaged and couldn't be sold. To make a 20% profit, at what price should each of the remaining gadgets be sold? [FSIBL PO 23]

A. 320 B. 330 C. 360 D. 400 **Ans: D**

Explanation:

Damaged = 10% of 100 = 10. So, the number of good gadgets = 100 -10 = 90

At 20% profit, total selling price = 120% of Tk. 30000 = Tk. 36000

∴ Price of each gadget to make 20% price = $\frac{36000}{90}$ = Tk. 400 (**Ans.**)

261. What is the product of the first 7 prime numbers? [FSIBL PO 23]

A. 210200 B. 340340 C. 454000 D. 510510 **Ans: D**

Explanation:

2×3×5×7×11×13×17 = 210×11×221 = 2310×221

সংখ্যা ২টি দেখলে স্পষ্ট বুঝায় যায় যে, গুনফলের শেষ ২টি অঙ্ক ১০ হবে, তাই উত্তর 510510

262. A square field with side 30m is surrounded by a path of uniform width. If the area of the path is 256m^2, its width is: [Jamuna MTO 23]

A. 14m B. 16m C. 4m D. 2m **Ans: D**

Explanation:

Let, width of the path be x meters.

One side with path = 30 + x + x = (30 + 2x) meters

As per question,

$(30 + 2x)^2 - 30^2 = 256$

Or, $900 + 120x + 4x^2 - 900 = 256$

Or, $4x^2 + 120x - 256 = 0$

Or, $4(x^2 + 30x - 64) = 0$

Or, $x^2 + 32x - 2x - 64 = 0$

Or, $(x + 32)(x-2) = 0$

∴ x = 2 [x ≠-32, because value cannot be negative]

∴ The width = 2 meters. (**Ans.**)

263. If $(x^3 + \frac{1}{x^3}) = 52$, the value of $(x + \frac{1}{x})$ is: [Jamuna MTO 23]

A. 4 B. 3 C. 6 D. 13 **Ans: A**

Explanation:

$x^3 + \frac{1}{x^3} = 52$

Or, $(x + \frac{1}{x})^3 - 3.x.\frac{1}{x}(x + \frac{1}{x}) = 52$

Or, $(x + \frac{1}{x})^3 - 3(x + \frac{1}{x}) = 52$

Or, $y^3 - 3y = 52$ [Let, $x + \frac{1}{x} = y$]

Putting value y = 4, from given option to make the equation justified.

$4^3 - 3\times 4 = 52$ Or, 64-12 = 52 ∴ 52 = 52

∴ $y = x + \frac{1}{x} = 4$ (**Ans.**)

264. $\frac{(598+479)^2-(598-479)^2}{598\times 479}$ **= ?** [Jamuna MTO 23]

A. 4 B. 10 C. 132 D. 8 **Ans: A**

Explanation:

$\frac{(598+479)^2-(598-479)^2}{598\times 479}$ [$4ab = (a+b)^2 - (a-b)^2$]

$= \frac{4\times 598\times 479}{598\times 479} = 4$ (**Ans.**)

265. If the area of a triangle is 150 sq. m and base: height is 3: 4, find its height. [Jamuna MTO 23]

A. 45cm B. 30cm C. 15cm D. 20cm **Ans: D**

Explanation:

Let, base be 3x and height be 4x.

We know,

Area of triangle = $\frac{1}{2}\times$ Base$\times$ Height

Or, 150 = $\frac{1}{2}\times$ 3x$\times$ 4x

Or, $6x^2 = 150$ Or, $x^2 = 25$ $\therefore x = 5$

$\therefore$ Height = 4$\times$5 = 20 meters. (**Ans.**)

266. The value of expression of $(1+x)(1+x^2)(1+x^4)(1+x^8)(1-x)$ is? [Jamuna MTO 23]

A. x^8+1 B. $x^{16}-1$ C. $1+x^{16}$ D. $1-x^{16}$ **Ans: D**

Explanation:

$(1+x)(1+x^2)(1+x^4)(1+x^8)(1-x)$

$= (1-x^2)(1+x^2)(1+x^4)(1+x^8) = (1-x^4)(1+x^4)(1+x^8) = (1-x^8)(1+x^8) = (1-x^{16})$ (**Ans.**)

267. A, B and C are three partners in a business. If A's capital is equal to twice B's capital and B's capital is three times C's capital, the ratio of the capital of A, B and C is? [Jamuna MTO 23]

A. 2: 1: 3 B. 1: 2: 6 C. 6: 3: 1 D. 1: 3: 6 **Ans: C**

Explanation:

Let, C's capital be x. So, B's capital = 3x and A's capital = 6x.

$\therefore$ A: B: C = 6x: 3x: x = 6: 3: 1 (**Ans.**)

268. If the perimeter of an equilateral triangle is 12 m, find its area. [Jamuna MTO 23]

A. $3\sqrt{4}$ B. $4\sqrt{3}$ C. $5\sqrt{3}$ D. $2\sqrt{5}$ **Ans: B**

Explanation:

One side of the equilateral triangle, a = $\frac{12}{3}$ = 4 m

$\therefore$ Area = $\frac{\sqrt{3}}{4}\times a^2 = \frac{\sqrt{3}}{4}\times 4^2 = 4\sqrt{3}$ (**Ans.**)

269. Which term of the series 72 + 63 + 54 + ---------- is zero? [Jamuna MTO 23]

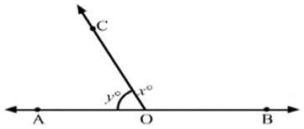
A. 8^{th} B. 9^{th} C. 10^{th} D. 11^{th} **Ans: B**

Explanation:

Difference = 72-63 = 9

$\therefore$ The term = $\frac{Last\ term - First\ term}{Difference} + 1 = \frac{72-0}{9} + 1 = 8 + 1 = 9^{th}$ (**Ans.**)

270. In the given figure, what is the value of x if 4x = 5y? [Jamuna MTO 23]



A. 100 B. 105 C. 110 D. 115 **Ans: A**

Explanation:

Here, 4x = 5y $\therefore y = \frac{4x}{5}$

Now,

$x + y = 180^0$

Or, $x + \frac{4x}{5} = 180^0$ Or, $\frac{5x+4x}{5} = 180^0$ Or, $\frac{9x}{5} = 180^0$

$\therefore x = 180^0\times\frac{5}{9} = 100^0$ (**Ans.**)

271. Out of 100 students, 50 failed in English and 30 in mathematics. If 12 students failed in both English and mathematics, then the number of students who passed in both the subjects is? [Jamuna MTO 23]

A. 26 B. 28 C. 30 D. 32 **Ans: D**

Explanation:

Total failed in one or both subject = 50 + 30 -12 = 68

$\therefore$ Both subjects passed = 100 -68 = 32(**Ans.**)

272. The average weight of 8 person's increases by 2.5 kg when a new person comes in place of one of them weighting 65 kg. What is the weight of the new person? [Jamuna MTO 23]
A. 70 kg B. 75 kg C. 80 kg D. 85 kg **Ans: D**
Explanation: (Shortcut)
∴ The weight of the new person = 65 + 8×2.5 kg = (65+ 20) kg = 85 kg (**Ans.**)

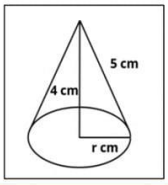
273. The length of a rectangular plot is twice its breadth. If the length of its diagonal is 9√5 meter, the perimeter of the rectangle is? [Jamuna MTO 23]
A. 27 m B. 54m C. 81m D. None of these **Ans: B**
Explanation:
Let, breadth be x meters. So, length = 2x meters.
We know,
Diagonal = $\sqrt{Length^2 + Breadth^2}$
Or, $9\sqrt{5} = \sqrt{(2x)^2 + x^2} = \sqrt{5x^2} = x\sqrt{5}$
∴ x = 9
∴ Perimeter = 2(2x + x) = 6x = 6×9 = 54 meters. (**Ans.**)

274. Rahim's collection contains US, Bangladeshi and British stamps. If the ratio of US to Bangladeshi stamps is 5 to 2 and the ratio of Bangladeshi to British stamps is 5 to 1. What is the ratio of US to British stamps? [FSIBL PO 23]
A. 5: 1 B. 10: 5 C. 15: 2 D. 25: 2 **Ans: D**
Explanation:
US: BD = 5: 2 = (5×5): (2×5) = 25: 10
BD: BT = 5: 1= (5×2): (1×2) = 10: 2
∴ US: BD: BT = 25: 10: 2
So, US: British = 25: 2 (**Ans.**)

275. Ages of three persons are now in the proportion of 2: 3: 4 and in five years from now, the proportion will be 5: 7: 8. What is the present age of the youngest person? [Jamuna MTO 23]
A. 10 years B. 20 years C. 30 years D. 40 years **Ans: B**
Explanation:
Let, three persons age be 2x, 3x and 4x respectively.
As per question,
$\frac{2x+5}{3x+5} = \frac{5}{7}$
Or, 15x + 25 = 14x + 35 Or, 15x -14x = 35-25 ∴ x = 10
∴ The present age of the youngest person = 2x = 2×10 = 20 years. (**Ans.**)

276. If selling price is doubled, the profit triples. Find the profit percent. [Rupali Officer 13, PKB Cash 21, Jamuna MTO 23]
A. 66 B. 100 C. 105 D. 120 **Ans: B**
Explanation:
Cost price be Tk. x and selling price be Tk. y
So, profit = Tk. (y-x)
New selling price = Tk. 2y; so, new profit = Tk. (2y-x)
As per question,
3(y-x) = 2y-x
Or, 3y-3x = 2y-x Or, 3y-2y = 3x-x ∴ y = 2x
∴ Profit = Tk. (y-x) = Tk. (2x-x) = Tk. x
∴ Profit percentage = $\frac{x}{x}$×100% = 100%(**Ans.**)

277. A sector of a circle of radius 5 cm is recast into a right circular cone of height 4 cm. What is the volume of the resulting cone? [GIBL PO 24]
A. 12π cm^3 B. 33π cm^3 C. 32π cm^3 D. 4π cm^3 **Ans: A**
Explanation:
Given that, Radius of circle recast into slant height of cone, l = 5 cm
and height of the cone, h = 4 cm.
Let, radius of the cone be r cm.
Radius, r = $\sqrt{(Slant\ hight)^2 - (height)^2} = \sqrt{5^2 - 4^2} = \sqrt{25-16} = \sqrt{9} = 3$
∴ Volume of the cone = $\frac{1}{3}\pi r^2 h = \frac{1}{3}\pi \times 3^2 \times 4 = 12\pi\ cm^2$ (**Ans.**)



278. A train takes 10 seconds to cross a pole and 20 seconds to cross a platform of length 200m. What is the length of the train? [BB AD 21, GIBL PO 24]

A. 400m B. 600m C. 200m D. 800m **Ans: C**

Explanation:

Let, length of the train be x m

As per question,

$\frac{x}{10} = \frac{x+200}{20}$

Or, 20x = 10x + 2000 Or, 20x – 10x = 2000 Or, 10x = 2000 ∴ x = 200

∴ The length of the train = 200 m(**Ans.**)

Note: প্লাটফর্ম অতিক্রম করার সময় প্লাটফর্ম ও ট্রেন উভয় দৈর্ঘ্য অতিক্রম করে কিন্তু পোল অতিক্রম করার সময় শুধু ট্রেনের দৈর্ঘ্য অতিক্রম করবে

279. If a bookstore owner buys 15 books less for Tk. 900 when the price of each book goes up by Tk. 3, then find the original price of a book. [GIBL PO 24]

A. Tk. 20 B. Tk. 18 C. Tk. 15 D. Tk. 12 **Ans: D**

Explanation:

Let, the original price of a book be Tk. x.

As per question,

$\frac{900}{x} - \frac{900}{x+3} = 15$

Or, $\frac{900x+2700-900x}{x(x+3)} = 15$ Or, 15x(x+3) = 2700

Or, $x^2 + 3x = \frac{2700}{15} = 180$ Or, $x^2 + 15x - 12x - 180 = 0$

Or, x(x +15)-12(x +15) = 0 Or, (x+15)(x-12) = 0

∴ x = 12 [x≠ -15]

∴ The original price of a book = Tk. 12.(**Ans.**)

280. The system of linear equation of x + y≤ 0, x≥0, y≥0 has- [Jamuna MTO 23]

A. Three solutions B. exactly,1 solution

C. No solution D. An indefinite number of solution **Ans: B**

Explanation:

Given that, x + y≤ 0, x≥0, y≥0

∴ Only x = 0 and y = 0 is the solution possible. So, exactly,1 solution (**Ans.**)

281. Jennifer flipped a coin three times and got heads each time. What is the probability that she gets head on the next flip? [BB AD 21, GIBL PO 22, GIBL PO 24]

A. 1 B. $\frac{1}{16}$ C. $\frac{1}{2}$ D. 0 **Ans: C**

Explanation:

১টি মুদ্রা নিক্ষেপ করায় ১ম তিন বারই হেড পড়েছে। ১ম তিন বারের প্রয়োজন নেই,পরবর্তী বার হেড পড়ার সম্ভাবতা বের করতে হবে।

∴ Required probability = $\frac{\text{Favourable outcomes}}{\text{Total Outcomes}} = \frac{1}{2}$(**Ans.**)

282. What is the greatest common factor of 24 and 64? [BB AD 21, GIBL PO 22, GIBL PO 24]

A. 8 B. 4 C. 12 D. 36 **Ans: A**

Explanation:

24) 64(2
48
16)24(1
16
8)16(2
16
0

∴ The greatest common factor = 8(**Ans.**)

283. If Elias, makes a box every 5 minutes and Nadim takes 7 minutes to make a box, what will be the ratio of the number of boxes produced by Elias to the number of boxes produced by Nadim if they work for 5 hours and 50 minutes? [GIBL PO 24]

A. 5 to 6 B. 5 to 7 C. 6 to 5 D. 7 to 5 **Ans: D**

Explanation:

5 hours and 50 min = 350 min

∴ Elias: Nadim = $\frac{350}{5} : \frac{350}{7}$ = 70: 50 = 7: 5 (**Ans.**)

284. Melissa is four times as old as Jim. Pat is 5 years older than Melissa. If Jim is y years old, how old is Pat? [BB AD 21, GIBL PO 24]

A. 4y + 5 B. 5y + 4 C. 4 – 5y D. y + 5 **Ans: A**

Explanation:

Jim = y years. So, Melissa = 4y

∴ Pat = 4y + 5(**Ans.**)

285. Which of the following is the average of first five prime numbers? [HBFC SO 17, GIBL PO 24]

A. 4.5 B. 5.6 C. 7.5 D. 8.6 **Ans: B**

Explanation:

The first five prime numbers are 2, 3, 5, 7, 11.

∴ Required average = $\frac{2+3+5+7+11}{5} = \frac{28}{5} = 5.6$ (**Ans.**)

286. X = {-4, -2, 1, 3} Y = {-1, 4, 5}. If x is a number from set X, and y is a number from set Y. The probability that (x +y) is positive is closest to: [GIBL PO 24]

A. 0.5 B. 0.6 C.0.7 D. 0.8 **Ans: C**

Explanation:

Given that, X = {-4, -2, 1, 3} and Y = {-1, 4, 5}

When, x = -4 and y = -1, then x + y = -4 – 1 = -5

When, x = -4 and y = 4, then x + y = -4+4 = 0

When, x = -4 and y = 5, then x + y = -4+5 = 1 (positive)

When, x = -2 and y = -1, then x + y = -2-1 = -3

When, x = -2 and y = 4, then x + y = -2 +4 = 2 (positive)

When, x = -2 and y = 5, then x + y = -2 + 5 = 3 (positive)

When, x = 1 and y = -1, then x + y = 1-1 = 0

When, x = 1 and y = 4, then x + y = 1+ 4 = 5 (positive)

When, x = 1 and y = 5, then x + y = 1 + 5 = 6 (positive)

When, x = 3 and y = -1, then x + y = 3-1 = 2 (positive)

When, x = 3 and y = 4, then x + y = 3 + 4 = 7 (positive)

When, x = 3 and y = 5, then x + y = 3 + 5 = 8 (positive)

∴ The probability = $\frac{Favourable\ Outcome}{Total\ outcome} = \frac{8}{12} = 0.67 \approx 0.7$ (**Ans.**)

287. Five people want to rent the last two copies of a movie. How many ways can these five people rent the two movies? [GIBL PO 24]

A. 10 B. 9 C. 8 D. 7 **Ans: A**

Explanation:

∴ The number of way that five people rent the two movies ${}^5C_2 = \frac{5!}{3!\times 2!} = \frac{5\times 4}{2} = 10$(**Ans.**)

288. x^2-25 = 12, x+5 = 4, x-5 =? [GIBL PO 24]

A. 2 B. 3 D. 6 C. 22 **Ans: B**

Explanation:

As per question,

x^2-25 = 12

Or, (x +5)(x-5) = 12 Or, 4(x-5) = 12 ∴ x -5 = $\frac{12}{4} = 3$ (**Ans.**)

289. The area of a rectangular classroom is x^2 -25. Which of the following binomials could represent the length and the width of the room? [GIBL PO 24]

A. (x +5)(x +5) B. (x-5)(x-5) C. (x+5)(x-5) D. x(x-25) **Ans: C**

Explanation:

∴ Area = Length ×Width = x^2 -25 = (x+5)(x-5) (**Ans.**)

290. In the coordinate plane, line m passes through the origin and has a slope of 3. If points (6, y) and (x, 12) are on line m, then y-x =? [GIBL PO 24]

A. 14 B. 18 C. 22 D. 26 **Ans: A**

Explanation:

Strait line equation, y = mx; m = slope

When point (6, y), then y = mx = 3×6 = 18

When point (x, 12), then y = mx Or, 12 = 3x ∴ x = 4

∴ y –x = 18- 4 = 12(**Ans.**)