



Quant Questions for XAT Set-2 PDF

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Instructions

For the following questions answer them individually

Question 1

If $R = (30^{65} - 29^{65}) / (30^{64} + 29^{64})$, then

- A $0 < R \leq 0.1$
- B $0.1 < R \leq 0.5$
- C $0.5 < R \leq 1.0$
- D $R > 1.0$

Answer: D

Explanation:

$\frac{(30^{65} - 29^{65})}{(30^{64} + 29^{64})} = ((30 - 29) * \frac{(30^{64} + 30^{63} * 29 + \dots + 29^{64})}{(30^{64} + 29^{64})})$, which is greater than 1. Hence option D.

Question 2

If $x = (16^3 + 17^3 + 18^3 + 19^3)$, then x divided by 70 leaves a remainder of

- A 0
- B 1
- C 69
- D 35

Answer: A

Explanation:

We know that $x = 16^3 + 17^3 + 18^3 + 19^3 = (16^3 + 19^3) + (17^3 + 18^3)$
 $= (16 + 19)(16^2 - 16 * 19 + 19^2) + (17 + 18)(17^2 - 17 * 18 + 18^2) = 35 \times \text{odd} + 35 \times \text{odd} = 35 \times \text{even} = 35 \times (2k)$
 $\Rightarrow x = 70k$
 \Rightarrow Remainder when divided by 70 is 0.

Instructions

Directions for the following two questions:

Mr. David manufactures and sells a single product at a fixed price in a niche market. The selling price of each unit is Rs. 30. On the other hand, the cost, in rupees, of producing x units is $240 + bx + cx^2$, where b and c are some constants. Mr. David noticed that doubling the daily production from 20 to 40 units increases the daily production cost by 66.67%. However, an increase in daily production from 40 to 60 units results in an increase of only 50% in the daily production cost. Assume that demand is unlimited and that Mr. David can sell as much as he can produce. His objective is to maximize the profit.

Question 3

What is the maximum daily profit, in rupees, that Mr. David can realize from his business?

- A 620
- B 920
- C 840
- D 760

E Cannot be determined

Answer: D

Explanation:

Cost of 20 units = $240+20b+400c$

Cost of 40 units = $240+40b+1600c = 5/3 * (240+20b+400c) \Rightarrow 720+120b+4800c = 1200+100b+2000c$

$\Rightarrow 480 = 20b + 2800c \Rightarrow 120 = 5b + 700c$

Cost of 60 units = $240+60b+3600c = 3/2 (240+40b+1600c) \Rightarrow 480 + 120b + 7200c = 720 + 120b + 4800c$

$\Rightarrow 240 = 2400c \Rightarrow c = 1/10$ and $b = 10$

Let the number of items needed for max profit be k

CP = $240 + 10k + k^2/10$

SP = $30k$

Profit = SP - CP = $30k - 240 - 10k - k^2/10 = 20k - 240 - k^2/10$

Maximum when $20 - k/5 = 0$ or $k = 100$

Profit = $2000 - 240 - 1000 = 760$

XAT Previous Papers

Instructions

For the following questions answer them individually

Question 4

Five horses, Red, White, Grey, Black and Spotted participated in a race. As per the rules of the race, the persons betting on the winning horse get four times the bet amount and those betting on the horse that came in second get thrice the bet amount. Moreover, the bet amount is returned to those betting on the horse that came in third, and the rest lose the bet amount. Raju bets Rs. 3000, Rs. 2000 and Rs. 1000 on Red, White and Black horses respectively and ends up with no profit and no loss.

Suppose, in addition, it is known that Grey came in fourth. Then which of the following cannot be true?

- A Spotted came in first
- B Red finished last
- C White came in second
- D Black came in second
- E There was one horse between Black and White

Answer: C

Explanation:

There are total 3 cases which satisfies the condition "no profit and no loss."

Case 1: White comes 2nd.(remaining two horses(red/black) come 4th/5th)

Profit from white horse = Final Amount - Initial Amount = $2000*3 - 2000 = 4000$

Loss from Red and Black horse = $3000+1000 = 4000$

Net profit = $4000-4000 = 0$

Case 2: Black, Red come second, third respectively.(remaining one horse(white) comes 4th/5th)

Profit from Black = $1000*3-1000 = 2000$

Profit from Red = $3000 - 3000 = 0$

Loss from white = 2000

Net profit = $2000-2000 = 0$

Case 3: black, white come first, third respectively.(remaining one horse(red) comes 4th/5th)

Profit from Black = $1000*4-1000 = 3000$

Profit from White = $2000 - 2000 = 0$

Loss from Red = 3000

Net Profit = 3000-3000=0

And it is mentioned that grey case 4th. ==> case 1 is wrong.(because, in that case red, black should come 4th,5th)

So option C cannot be true.

Question 5

John borrowed Rs. 2,10,000 from a bank at an interest rate of 10% per annum, compounded annually. The loan was repaid in two equal instalments, the first after one year and the second after another year. The first instalment was interest of one year plus part of the principal amount, while the second was the rest of the principal amount plus due interest thereon. Then each instalment, in Rs., is

Answer:121000

Explanation:

We have to equate the installments and the amount due either at the time of borrowing or at the time when the entire loan is repaid. Let us bring all values to the time frame in which all the dues get settled, i.e, by the end of 2 years.

John borrowed Rs. 2,10,000 from the bank at 10% per annum. This loan will amount to $2,10,000 \times 1.1 \times 1.1 = \text{Rs.} 2,54,100$ by the end of 2 years.

Let the amount paid as installment every year be Rs.x.

John would pay the first installment by the end of the first year. Therefore, we have to calculate the interest on this amount from the end of the first year to the end of the second year. The loan will get settled the moment the second installment is paid.

$$\Rightarrow 1.1x + x = 2,54,100$$

$$2.1x = 2,54,100$$

$$\Rightarrow x = \text{Rs. } 1,21,000.$$

Therefore, 121000 is the correct answer.

Question 6

The average of 7 consecutive numbers is P. If the next three numbers are also added, the average shall

- A remain unchanged
- B increase by 1
- C increase by 1.5
- D increase by 2

Answer: C

Explanation:

Let the 7 consecutive numbers be a-3, a-2, a-1, a, a+1, a+2 and a+3.

Sum of the numbers = 7a and the average of these numbers = a

If next 3 numbers a+4, a+5 and a+6 are also added then the average of these 10 numbers =

$$\frac{7a + a + 4 + a + 5 + a + 6}{10} = a + 1.5$$

Thus, the average increases by 1.5

Hence, option C is the correct answer.

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Question 7

The strength of a salt solution is p% if 100 ml of the solution contains p grams of salt. If three salt solutions A, B, C are mixed in the proportion 1 : 2 : 3, then the resulting solution has strength 20%. If instead the proportion is 3 : 2 : 1, then the resulting solution has strength 30%. A fourth solution, D, is produced by mixing B and C in the ratio 2 : 7. The ratio of the strength of D to that of A is

A 3 : 10

B 1 : 3

C 1 : 4

D 2 : 5

Answer: B

Explanation:

Let 'a', 'b' and 'c' be the concentration of salt in solutions A, B and C respectively.

It is given that three salt solutions A, B, C are mixed in the proportion 1 : 2 : 3, then the resulting solution has strength 20%.

$$\begin{aligned} a + 2b + 3c \\ \Rightarrow 1 + 2 + 3 = 20 \end{aligned}$$

$$\Rightarrow a + 2b + 3c = 120 \dots (1)$$

If instead the proportion is 3 : 2 : 1, then the resulting solution has strength 30%.

$$\begin{aligned} 3a + 2b + c \\ \Rightarrow 1 + 2 + 3 = 30 \end{aligned}$$

$$\Rightarrow 3a + 2b + c = 180 \dots (2)$$

From equation (1) and (2), we can say that

$$\Rightarrow b + 2c = 45$$

$$\Rightarrow b = 45 - 2c$$

Also, on subtracting (1) from (2), we get

$$a - c = 30$$

$$\Rightarrow a = 30 + c$$

In solution D, B and C are mixed in the ratio 2 : 7

$$\text{So, the concentration of salt in D} = \frac{2b + 7c}{9} = \frac{90 - 4c + 7c}{9} = \frac{90 + 3c}{9}$$

$$\text{Required ratio} = \frac{90 + 3c}{9a} = \frac{90 + 3c}{9(30 + c)} = 1 : 3$$

Hence, option B is the correct answer.

Question 8

If $xy + yz + zx = 0$, then $(x + y + z)^2$ equals

A $(x + y)^2 + xz$

B $(x + z)^2 + xy$

C $x^2 + y^2 + z^2$

D $2(xy + yz + zx)$

Answer: C

Explanation:

$$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$$

$$\text{as } xy + yz + zx = 0$$

$$\text{so equation will be resolved to } x^2 + y^2 + z^2$$

Question 9

If $x + 1 = x^2$ and $x > 0$, then $2x^4$ is

- A $6 + 4\sqrt{5}$
- B $3 + 3\sqrt{5}$
- C $5 + 3\sqrt{5}$
- D $7 + 3\sqrt{5}$

Answer: D

Explanation:

We know that $x^2 - x - 1 = 0$

Therefore $x^4 = (x + 1)^2 = x^2 + 2x + 1 = x + 1 + 2x + 1 = 3x + 2$

Therefore, $2x^4 = 6x + 4$

We know that $x > 0$ therefore, we can calculate the value of x to be $\frac{1+\sqrt{5}}{2}$

Hence, $2x^4 = 6x + 4 = 3 + 3\sqrt{5} + 4 = 3\sqrt{5} + 7$

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Question 10

The product of the distinct roots of $|x^2 - x - 6| = x + 2$ is

- A -16
- B -4
- C -24
- D -8

Answer: A

Explanation:

We have, $|x^2 - x - 6| = x + 2$

$\Rightarrow |(x-3)(x+2)| = x+2$

For $x < -2$, $(3-x)(-x-2) = x+2$

$\Rightarrow x-3=1 \Rightarrow x=4$ (Rejected as $x < -2$)

For $-2 \leq x < 3$, $(3-x)(x+2) = x+2 \Rightarrow x=2, -2$

For $x \geq 3$, $(x-3)(x+2) = x+2 \Rightarrow x=4$

Hence the product = $4 \cdot -2 \cdot 2 = -16$

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