Profit Loss and Interest Questions for MAH - CET

Instructions

For the following questions answer them individually

Question 1

Rani bought more apples than oranges. She sells apples at Rs. 23 apiece and makes 15% profit. She sells oranges at Rs. 10 apiece and marks 25% profit. If she gets Rs. 653 after selling all the apples and oranges, find her profit percentage.

A 16.8%

B 17.4%

C 17.9%

D 18.5%

E 19.1%

   Answer: B

Explanation:

Let number of apples = x and oranges = y

=> $23x + 10y = 653$ $(x > y)$

Since, 653 has last digit 3, which is possible when 23 is multiplies by 1,11,21,31 and so on.

Also, $x > y$ => $x = 21$ and $y = 17$

=> C.P. of 1 apple = $\frac{100}{115} \times 23 = 20$

C.P. of 1 orange = $\frac{100}{125} \times 10 = 8$

=> Total C.P. = $(21 \times 20) + (17 \times 8) = 420 + 136 = 556$

$\therefore$ Profit % = $\frac{653-556}{556} \times 100 = 17.4\%$

Question 2

The Maximum Retail Price (MRP) of a product is 55% above its manufacturing cost. The product is sold through a retailer, who earns 23% profit on his purchase price. What is the profit percentage (expressed in nearest integer) for the manufacturer who sells his product to the retailer? The retailer gives 10% discount on MRP.

A 31%

B 22%

C 15%

D 13%

E 11%

   Answer: D

Explanation:

Let Manufacturing Cost of the product = $Rs.100$

=> Maximum Retail Price(MRP) = $100 + \frac{55}{100} \times 100 = Rs.155$

Retailer gives 10% discount on MRP

=> Retailer's selling price = $155 - \frac{10}{100} \times 155 = Rs.139.5$

It is given that the retailer earned 23% profit on his purchase price, say $Rs.x$

=> $\frac{123x}{100} = 139.5$

=> $x = \dfrac{13950}{123} = 113.41$

Now, the purchase price of retailer = x = selling price of Manufacturer

∴ Profit earned by Manufacturer = $113.41 - 100 = 13.41$

$\approx 13\%$

Question 3

In the beginning of the year 2004, a person invests some amount in a bank. In the beginning of 2007, the accumulated interest is Rs. 10,000 and in the beginning of 2010, the accumulated interest becomes Rs. 25,000. The interest rate is compounded annually and the annual interest rate is fixed. The principal amount is:

A Rs. 16,000

B Rs. 18,000

C Rs. 20,000

D Rs. 25,000

E None of the above

Answer: C

Explanation:
Let the principal amount = P and rate of interest = $r\%$

Interest accumulated from 2004 to 2007 is Rs.10,000 and from 2004 to 2010 is Rs.25,000

Using, $C.I. = P[(1 + \dfrac{R}{100})^T - 1]$

=> $P[(1 + \dfrac{r}{100})^3 - 1] = 10,000$ ---------Eqn(I)

and $P[(1 + \dfrac{r}{100})^6 - 1] = 25,000$ ----------Eqn(II)

Dividing eqn(II) from (I), we get :

=> $\dfrac{P[(1+\frac{r}{100})^6-1]}{P[(1+\frac{r}{100})^3-1]} = \dfrac{5}{2}$

Let $(1 + \dfrac{r}{100})^3 = x$

=> $\dfrac{x^2-1}{x-1} = \dfrac{5}{2}$

=> $2x^2 - 5x + 3 = 0$

=> $(2x - 3)(x - 1) = 0$

=> $x = \dfrac{3}{2}, 1$ $(x \neq 1)$ because then, r = 0

=> $(1 + \dfrac{r}{100})^3 = \dfrac{3}{2}$

Substituting it in eqn(I)

=> $P[\dfrac{3}{2} - 1] = 10,000$

=> $P = 10,000 \times 2 = 20,000$

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Question 4

A man borrows 6000 at 5% interest, on reducing balance, at the start of the year. If he repays 1200 at the end of each year, find the amount of loan outstanding, in , at the beginning of the third year.

A 3162.75

B 4125.00

C 4155.00

D 5100.00

E 5355.00

Answer: C

Explanation:
Amount man gets after 1 year

= $6000 + (\frac{6000 \times 5 \times 1}{100}) - 1200$

= $6000 + 300 - 1200 = 5100$

∴ Amount at the beginning of third year, i.e. after 2 years

= $5100 + (\frac{5100 \times 5 \times 1}{100}) - 1200$

= $5100 + 255 - 1200 = 4155$

Question 5

Nikhil's mother asks him to buy 100 pieces of sweets worth 100/-. The sweet shop has 3 kinds of sweets, kajubarfi, gulabjamun and sandesh. Kajubarfi costs 10/- per piece, gulabjamun costs 3/- per piece and sandesh costs 50 paise per piece. If Nikhil decides to buy at least one sweet of each type, how many gulabjamuns should he buy?

A 1

B 2

C 3

D 4

E 5

Answer: A

Explanation:
Let Nikhil buy x, y and z pieces of kajubarfi, gulabjamun and sandesh respectively. $(x, y, z \geq 1)$

=> $x + y + z = 100$ --------------Eqn(I)

Also, $10x + 3y + \frac{1}{2}z = 100$

=> $20x + 6y + z = 200$ ----------Eqn(II)

Subtracting eqn(I) from (II), we get :

=> $19x + 5y = 100$

=> $y = \frac{100 - 19x}{5}$

If $x = 1$, y will not be natural. The only value of x for natural y is $x = 5$

=> $y = \frac{100 - 95}{5} = 1$

∴ Nikhil must buy 1 gulabjamun.

Question 6

A potter asked his two sons to sell some pots in the market. The amount received for each pot was same as the number of pots sold. The two brothers spent the entire amount on some packets of potato chips and one packet of banana chips. One brother had the packet of banana chips along with some packets of potato chips, while the other brother just had potato chips. Each packet of potato chips costs 10/- and the packet of banana chips costs less than 10/-. The packets of chips were divided between the two brothers so each brother received equal number of packets. How much money should one brother give to the other to make the division financially equitable?

A 1

B 2

C 4

D 5

E 7

 Answer: B

Explanation:

Let 'n' be the number of potato chips bought by the brothers. Also let 'x' be the cost price of a banana chips. (x < 10)

Total number of chips purchases = (n + 1). It is given that each brother has equal number of chips packets i.e. (n + 1) is an even number or we can say that 'n' is odd.

Total amount spend by the brother on these chips packets = 10n + x. It is given that the amount received for each pot was same as the number of pots sold.

Hence, we can say that 10n + x is a perfect square. We can see that the tens place digit is an odd number.

Perfect squares ending with an odd digit in the tens place = 16, 36, 196, 256 and so on {All $(10a \pm 4)^2$ type numbers}

We can see that unit place is 6 in all cases and that will be the same as cost price of a banana chips packet.

The difference between the amount with the two friends = Cost price of 1 potato chips packet - Cost price of 1 banana chips packet = 10 - 6 = 4

Hence, we can say that the brother, who has only chips packets with him, should given Rs.2 to the other brother so that they have the same amount with them.

Therefore, option B is the correct answer.

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Question 7

Ram and Shyam form a partnership (with Shyam as working partner) and start a business by
investing 4000 and 6000 respectively. The conditions of partnership were as follows:
1. In case of profits till 200,00 per annum, profits would be shared in the ratio of the invested capital.
2.Profits from 200,001 till 400,000 Shyam would take 20% out of the profit, before the division of remaining profits, which will then be based on ratio of invested capital.
3.Profits in excess of 400,000, Shyam would take 35% out of the profits beyond 400,000, before the division of remaining profits, which will then be based on ratio of invested capital.
If Shyam's share in a particular year was 367000, which option indicates the total business
profit (in) for that year?

A 520,000

B 530,000

C 540,000

D 550,000

Answer: D

Explanation:

Ratio of profits earned by Ram : Shyam = 4000 : 6000

= 2 : 3

If profit < 2,00,000

% of profit earned by Shyam = $\frac{3}{5} \times 100$ = 60%

If 2,00,000 < profit < 4,00,000, he gets 20 % and 60 % of the remaining profit.

% of profit earned by Shyam = 20% + .80 $\times$ 60% = 68%

If profit > 4,00,000

% of profit earned by Shyam = 35 % + .65 $\times$ 60% = 74%

Now, for first 2,00,000 profit earned by Shyam = $\frac{60}{100} \times$ 2,00,000 = Rs. 1,20,000

For second 2,00,000 profit earned by Shyam = $\frac{68}{100} \times$ 2,00,000 = Rs. 1,36,000

Let total profit earned by them = Rs. (4,00,000 + x)

=> From $Rs.x$ profit, Shyam received = 3,67,000 - 1,20,000 - 1,36,000 = Rs. 1,11,000

=> $\frac{74}{100} \times x$ = 1,11,000

=> x = 1,11,000 $\times \frac{100}{74}$ = 1,50,000

∴ Total profit = 4,00,000 + 1,50,000 = Rs. 5,50,000

Question 8

Bennett distribution company, a subsidiary of a major cosmetics manufacturer Bavlon, is forecasting the zonal sales for the next year. Zone I with current yearly sales of Rs. 193.8 lakh is expected to achieve a sales growth of 7.25%; Zone II with current sales of Rs. 79.3 lakh is expected to grow by 8.2%; and Zone III with sales of Rs. 57.5 lakh is expected to increase sales by 7.15%. What is the Bennett's expected sales growth for the next year?

A   7.46%

B   7.53%

C   7.88%

D   7.41%

Answer: A

Explanation:

zone 1 will grow to become 193.8*1.0725= 207.85

zone 2 will grow to become 79.3*1.082=85.8

zone 3 will grow to become 57.5*1.0715=61.61

Total sales this year = 355.26

Total sales last year = 330.6

Growth = $\frac{355}{330}$ = 1.0746 i.e. growth of 7.46%

Question 9

A Techno company has 14 machines of equal efficiency in its factory. The annual manufacturing costs are Rs. 42,000 and establishment charges are Rs. 12,000. The annual output of the company is Rs. 70,000. The annual output and manufacturing costs are directly proportional to the no. of machines. The shareholders get 12.5% of the total profit which is equal to the total output minus the total cost. If 7.14% of machines remain closed throughout the year, then the percentage decrease in the amount of profit of the shareholders would be:

A 12%

B 12.5%

C 13.0%

D None of these

   Answer: B

Explanation:

Manufacturing cost (MC) of 14 machines = R s. 42000

Output of 14 machines = Rs. 70000

Establishment cost (EC) = Rs. 12000

Profit = Rs.(70000 - 42000 - 12000) = Rs. 16000

Shareholder's profit = 12.5% of Rs. 16000 = Rs. 2000

It is given that 7.14% of the machines were non functional which means only 13 machines were functional.

MC of 13 machines = Rs. (42000 * $\frac{13}{14}$) = Rs. 39000 [As it is directly proportional to the number of functional machines]

Output of 13 machines = Rs. (70000 * $\frac{13}{14}$) = Rs. 65000 [As it is directly proportional to the number of functional machines]

EC of 13 machines = Rs. 12000 [As it does not depend on the number of functional machines]

Profit = Rs.(65000 - 39000 - 12000) = Rs. 14000

Shareholder's profit = 12.5% of Rs. 14000 = Rs. 1750

Reduction in Shareholder's profit = Rs.(2000 - 1750) = Rs. 250

Reduction % = $\frac{250}{2000}$*100% = 12.5%

Hence, option B is the correct answer.

Question 10

Shyam, Gopal and Madhur are three partners in a business. Their capitals are respectively Rs 4000,Rs 8000 and Rs 6000. Shyam gets 20% of total profit for managing the business. The remaining profit is divided among the three in the ratio of their capitals. At the end of the year, the profit of Shyam is Rs 2200 less than the sum of the profit of Gopal and Madhur. How much profit, Madhur will get?

A Rs.1600

B Rs.2400

C Rs.3000

D Rs.5000

   Answer: B

Explanation:

Let the total profit be P. Shyam will get 0.2P for managing the business rest 0.8 P will be divided in the ratio of 2:4:3

i.e. shyam will get 0.2P+0.8P*$\frac{2}{9}$ and Gopal and Madhur will together get 0.8P*$\frac{7}{9}$

Given that 0.8P*$\frac{7}{9}$ - (0.2P+0.8P*$\frac{2}{9}$) = 2200

Solving we get P = 9000 therefore profit madhur will get is $0.8 * 9000 * \frac{1}{3}$ = 2400

Therefore our answer is option 'B'

Question 11

To start a new enterprise, Mr. Yogesh has borrowed a total of Rs. 60,000 from two money lenders with the interest being compounded annually, to be repaid at the end of two years. Mr. Yogesh repaid Rs.38, 800 more to the first money lender compared to the second money lender at the end of two years. The first money lender charged an interest rate, which was 10% more than what was charged by the second money lender. If Mr. Yogesh had instead borrowed Rs. 30,000 from each at their respective initial rates for two years, he would have paid Rs.7, 500 more to the first money lender compared to the second. Then money borrowed by Mr. Yogesh from first money lender is?

A 20,000

B 35,000

C 40,000

D 42,000

Answer: C

Explanation:

Let the interest on the second part be r %

Then, the rate on the first part = (r + 10)%It is given that,

$$30000(1 + \frac{r+10}{100})^2 - 30000(1 + \frac{r}{100})^2 = 7500$$

On solving, we get r = 20%

Let the first part be Rs. a

Then, the second part = Rs. (60000 - a)

$$a(1 + \frac{20+10}{100})^2 - (60000 - a)(1 + \frac{20}{100})^2 = 38800$$

On solving, we get a = Rs. 40000

Hence, option C is the correct answer.

Question 12

A small and medium enterprise imports two components A and B from Taiwan and China respectively and assembles them with other components to form a toy. Component A contributes to 10% of production cost. Component B contributes to 20% of the production cost. Usually the company sells this toy at 20% above the production cost. Due to increase in the raw material and labour cost in both the countries, component A became 20% costlier and component B became 40% costlier. Owing to these reasons the company increased its selling price by 15%. Considering that cost of other components does not change, what will be the profit percentage, if the toy is sold at the new price?

A 15.5%

B 25.5%

C 35.5%

D 40%

Answer: B

Explanation:

Let the production cost be Rs. 100

The, Selling Price = Rs. 120

Price of component A = Rs. 10

Price of component B = Rs. 20

Price of other components = Rs. (100 - 10 - 20) = Rs. 70

After increase in prices,

Price of component A = Rs. 12

Price of component B = Rs. 28

Price of other components = Rs. 70
Total Cost of production = Rs. (12 + 28 + 70) = Rs. 110
Selling price = Rs. (1.15 * 120) = Rs. 138
Profit = Rs. 28
Profit % = 25.45%

Hence, option B is the correct answer.

Question 13

Sujoy, Mritunjoy and Paranjoy are three friends, who have worked in software firms Z Solutions, G Software's and R Mindpower respectively for decade. The friends decided to float a new software firm named XY Infotech in January 2010. However, due to certain compulsions, Mritunjoy and Paranjoy were not able to immediately join the start-up in the appointed time. It was decided between friends that Sujoy will be running the venture as the full time director during 2010, and Mritunjoy and Paranjoy will be able to join the business only in January 2011. In order to compensate Sujoy for his efforts, it was decied that he will receive 10 percent of the profits and in the first year will invest lesser amount as compared to his friends. The remaining profit will be distributed among the friends in line with their contribution. Sujoy invested Rs. 35,000/- for 12 months, Mritunjoy invested Rs. 1,30,000/- for 6 months and Paranjoy invested Rs. 75,000/- for 8 months. If the total profit earned during 2010 was Rs. 4,50,000/-, then Paranjoy earned a profit of:

A   Rs. 1, 75, 500

B   Rs. 1, 35, 000

C   Rs. 1, 39, 500

D   None of the above

   Answer: B

Explanation:
Total profit = Rs. 450000
Sujoy will get 10% of this.
So, the profit to be distributed = Rs. 405000
Sujoy's investment = 12 * Rs. 35000 = Rs. 420000
Mritunjoy's investment = 6 * Rs. 130000 = Rs.780000
Paranjoy's investment = 8 * Rs. 75000 = Rs. Rs. 600000

Paranjoy's share in profit = Rs. $\frac{600000}{420000 + 780000 + 600000}$ * 405000 = Rs. 135000

Hence, option B is the correct answer.

Question 14

Mr. Mishra invested Rs.25,000 in two fixed deposits X and Y offering compound interest @ 6% per annum and 8% per annum respectively. If the total amount of interest accrued in two years through both fixed deposits is Rs.3518, the amount invested in Scheme X is

A   Rs. 12,000

B   Rs. 13,500

C   Rs. 15,000

D   Cannot be determined

   Answer: C

Explanation:
Let the amount invested in X = x
Thus, the amount invested in Y = 25000-x

The interest incurred = 3518 Rs, thus the total amount at the end of the 2nd year = 28518 Rs.

Thus, $x * (1.06)^2 + (25000 - x) * (1.08)^2 = 28518$

=> $x * 1.1236 + 25000 * 1.11664 - x * 1.11664 = 28518$

=> $-0.0428x + 29160 = 28518$

=> $642 = 0.0428x$

Hence, $x = 15000 Rs$

Hence, option C is the correct answer.

Question 15

Rohit bought 20 soaps and 12 toothpastes. He marked-up the soaps by 15% on the cost price of each, and the toothpastes by Rs.20 on the cost price each. He sold 75% of the soaps and 8 toothpastes and made a profit of Rs.385. If the cost of a toothpaste is 60% the cost of a soap and he got no return on unsold items, what was his overall profit or loss?

A Loss of Rs.355

B Loss of Rs.210

C Loss of Rs.250

D None of the above

Answer: A

Explanation:
Let the CP of 1 soap = S
Thus, the CP of 1 toothbrush = 0.6S
Given that, SP of 1 soap = 1.15 S and SP of 1 toothbrush = 0.6S+20
Also, 15*1.15*S + 8*(0.6S+20) - 15S - 8*0.6*S = 385
Thus, solving we get S = 100
Hence, Total CP of 20 soaps and 12 toothbrush = 20*100 + 12*60 = 2720
SP of 15 soaps and 8 toothbrush = 15*1.15*100 + 8*80 = 2365
Thus, the overall loss = 2365 - 2720 = 355 Rs.
Hence, option A is the correct answer.

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Question 16

Three years ago, your close friend had won a lottery of Rs. 1 crore. He purchased a flat for Rs. 40 lakhs, a car for Rs. 20 lakhs and shares worth Rs. 10 lakhs. He put the remaining money in a bank deposit that pays compound interest @ 12 percent per annum. If today, he sells off the flat, the car and the shares at certain percentage of their original value and withdraws his entire money from the bank, the total gain in his assets is 5%. The closest approximate percentage of the original value at which he sold off the three items is

A 60 percent

B 75 percent

C 90 percent

D 105 percent

Answer: C

Explanation:
Hi total gain = 5%
Thus, the amount at the end of 3 years = 105 lakh Rupees
The amount he gets from the bank = $30(1.12)^3 = 42.14784$ lakh rupees
Let x be the percentage at which he sells the assets of worth 70 lakhs
Thus, the amount he gets = 0.7x lakhs
Thus, 70x + 42.1478 = 105

Thus, 70x = 62.8525

Thus, x is closest to 0.90= 90%

Hence, option C is the correct answer.

Question 17

Eight years after completion of your MBA degree, you start a business of your own. You invest INR 30,00,000 in the business that is expected to give you a return of 6%, compounded annually. If the expected number of years by which your investment shall double is 72/r, where r is the percent interest rate, the approximate expected total value of investment (in INR) from your business 48 years later is:

A   2,40,00,000

B   3,60,00,000

C   4,80,00,000

D   None of the above

   Answer: C

Explanation:

Eight years after completion of your MBA degree, you start a business of your own. You invest INR 30,00,000 in the business that is expected to give you a return of 6%, compounded annually. If the expected number of years by which your investment shall double is 72/r, where r is the percent interest rate, the approximate expected total value of investment (in INR) from your business 48 years later is:

It is given that the expected number of years by which your investment shall double is 72/r, where r is the percent interest rate.

We are given that r = 6%. Therefore, it will take 72/6 = 12 years for money to grow twice of initial investment. In every 12 years, the money will become 2 fold. Therefore, in 48 years money will grow to = $2^{48/12}$ = 16 times.

Therefore, the approximate expected total value of investment (in INR) from your business 48 years later = 16*30,00,000 = 4,80,00,000.

Question 18

A pharmaceutical company manufactures 6000 strips of prescribed diabetic drugs for Rs. 8,00,000 every month. In July 2014, the company supplied 600 strips of free medicines to the doctors at various hospitals. Of the remaining medicines, it was able to sell 4/5th of the strips at 25 percent discount and the balance at the printed price of Rs. 250. Assuming vendor's discount at the rate of a uniform 30 percent of the total revenue, the approximate percentage profit / loss of the pharmaceutical company in July 2014 is:

A   5.5 percent (profit)

B   4 percent (loss)

C   5.5 percent (loss)

D   None of the above

   Answer: C

Explanation:

It is given that a total of 6000 strips are manufactured out of which the company supplied 600 strips of free medicines to the doctors.

Hence, the number of strips which were sold = 6000 - 600 = 5400.

It is given that the company was able to sell 4/5th of the strips at 25 percent discount and the balance at the printed price of Rs. 250.

Total revenue generated by the firm = $(0.75 * 250) * (\frac{4}{5} * 5400) + (250) * (\frac{1}{5} * 5400)$ = Rs. 1080000

Net revenue after vendor's discount = 0.7*1080000 = Rs. 756000

We can see that the company invested Rs. 800000 for the drug creation.

Hence, percentage loss incurred by the company = $\frac{800000 - 756000}{800000} * 100$ = 5.5%

Therefore, option C is the correct answer.

Instructions

Answer the questions based on the following information.

Rajat is sales manager of Dubin Computers Ltd. and looks after Delhi market. The company sells laptops in India. He is currently trying to select a distributor for coming five years. The distributor ensures that the products are accessible to the customers in the market. Market share of a company depends on the coverage by the distributor. The total profit potential of the entire laptop market in Delhi is Rs. 5 crores in the current year and present value of next four years' cumulative profit potential is Rs. 15 crores. The first choice for Rajat is to enter into long-term contract with a distributor M/s Jagan with whom Dubin has done business in the past, and whose distribution system reaches 55 percent of all potential customers. At the last moment, however, a colleague suggests Rajat to consider signing a one-year contract with other distributors. Distributors M/s Bola and M/s James are willing to be partner with Dubin. Although a year ago M/s Bola's and M/s James's coverage reached only 40 and 25 percent of customers respectively, they claim to have invested heavily in distribution resources and now expect to be able to reach 60 percent and 75 percent of customers respectively. The probability of M/s Bola's claim and M/s James's claim to be true is 0.60 and 0.20 respectively. The knowledge about distributors' coverage will evolve over time. The assumption is that the true level of coverage offered by the new distributors could be discovered, with certainty, through a one-year trail, and this trail will reveal exactly one of the two levels of coverage: for example in case of M/s Bola – 40 percent (as it was last year) or 60 percent (as claimed). In addition, it is also assumed that whatever the coverage is for both distributors, it will not change over time. Rajat narrows down on three choices, which are as follows:

Choice 1. Give a five year contract to the familiar distributor M/s Jagan.
Choice 2. Give a one year contract to the new distributor M/s Bola, and base next year's decision to renew contract with M/s Bola on observed coverage for next four years or enter into a four years' contract with M/s Jagan.
Choice 3. Give a one-year contract to the new distributor M/s James, and base next year's decision to renew contract with M/s James on observed coverage for next four years or enter into a four years contract with M/s Jagan..

Question 19

The expected present value of the five years cumulative profit with choice 3 is:

A   Rs. 12.7 crores

B   Rs. 10.6 crores

C   Rs. 11.7 crores

D   None of the above

Answer: B

Explanation:
We are left with 3 choices.

Choice 1:

The first choice is to give the contract to M/S Jagan. In this case, we know that Jagan's market reach is 55%. It has been given that the total profit potential is 5 crores in the present year and 15 crores in the next 4 years.

Therefore, the expected value of profit earned for choice 1 is 0.55*(5+15) = Rs.11 crore.

Choice 2:

Give the contract to M/s Bola for one year and based on the performance, renew the contract with him for the next 4 years or give M/S Jagan the contract for the next 4 years.

Let us assume that M/S Bola retains the contract for all 5 years. Rajat will renew the contract only if M/S Bola's claim that their market reach is 60% is true. The probability of the claim being true is 0.6.

Therefore, the EV of return if M/S Bola bags the contract for all 5 years = 0.6*0.6*(5+15) = Rs. 7.2 crores.

Let us assume that M/S Bola's claim is false. The probability of the claim being false is 1-0.6 = 0.4.

Now, if the claim is false, Rajat will terminate the contract by the end of the year and will partner with M/S Jagan for the next 4 years. Also, we have historic data that M/S Bola reaches 40% of the customers. Even if the claim is false, the laptops will reach 40% of the customers in the first year and 55% of the customers from the second year (Since M/S Jagan will bag the contract).

Therefore, the EV of profit in this case is 0.4*0.4*5+0.4*0.55*15 = 0.8 + 3.3 = Rs.4.1 crores.

Therefore, the total EV if M/S Bola bags the contract the first year is 7.2+4.1 = Rs.11.3 crores.

Choice 3:

Give the contract to M/s James for one year and based on the performance, renew the contract with him for the next 4 years or give M/S Jagan the contract for the next 4 years.

Let us assume that M/S James retains the contract for all 5 years. Rajat will renew the contract only if M/S Jame's claim that their market reach is 75% is true. The probability of the claim being true is 0.2.

Therefore, the EV of return if M/S James bags the contract for all 5 years = 0.2*0.75*(5+15) = Rs. 3 crores.

Let us assume that M/S James's claim is false. The probability of the claim being false is 1-0.2 = 0.8.

Now, if the claim is false, Rajat will terminate the contract by the end of the year and will partner with M/S Jagan for the next 4 years. Also, we have historic data that M/S James reaches 25% of the customers. Even if the claim is false, the laptops will reach 25% of the customers in the first year and 55% of the customers from the second year (Since M/S Jagan will bag the contract).

Therefore, the EV of profit in this case is 0.8*0.25*5+0.8*0.55*15 = 1 + 6.6 = Rs.7.6 crores.

Therefore, the total EV if M/S Bola bags the contract the first year is 3+7.6 = Rs.10.6 crores.

EV of choice 1 = Rs. 11 crores
EV of choice 2 = Rs. 11.3 crores
EV of choice 3 = Rs. 10.6 crores

The expected value of choice 3 is Rs.10.6 crores. Therefore, option B is the right answer.

Question 20

Which of the following statements is TRUE?

A   Choice 1 is more profitable than Choice 2

B   Choice 3 is more profitable than Choice 2

C   Choice 3 is more profitable than Choice 1

D   None of the above

  Answer: D

Explanation:
We are left with 3 choices.

Choice 1:

The first choice is to give the contract to M/S Jagan. In this case, we know that Jagan's market reach is 55%. It has been given that the total profit potential is 5 crores in the present year and 15 crores in the next 4 years.

Therefore, the expected value of profit earned for choice 1 is 0.55*(5+15) = Rs.11 crore.

Choice 2:

Give the contract to M/s Bola for one year and based on the performance, renew the contract with him for the next 4 years or give M/S Jagan the contract for the next 4 years.

Let us assume that M/S Bola retains the contract for all 5 years. Rajat will renew the contract only if M/S Bola's claim that their market

reach is 60% is true. The probability of the claim being true is 0.6.

Therefore, the EV of return if M/S Bola bags the contract for all 5 years = 0.6*0.6*(5+15) = Rs. 7.2 crores.

Let us assume that M/S Bola's claim is false. The probability of the claim being false is 1-0.6 = 0.4.
Now, if the claim is false, Rajat will terminate the contract by the end of the year and will partner with M/S Jagan for the next 4 years.
Also, we have historic data that M/S Bola reaches 40% of the customers. Even if the claim is false, the laptops will reach 40% of the customers in the first year and 55% of the customers from the second year (Since M/S Jagan will bag the contract).

Therefore, the EV of profit in this case is 0.4*0.4*5+0.4*0.55*15 = 0.8 + 3.3 = Rs.4.1 crores.

Therefore, the total EV if M/S Bola bags the contract the first year is 7.2+4.1 = Rs.11.3 crores.

Choice 3:

Give the contract to M/s James for one year and based on the performance, renew the contract with him for the next 4 years or give M/S Jagan the contract for the next 4 years.

Let us assume that M/S James retains the contract for all 5 years. Rajat will renew the contract only if M/S Jame's claim that their market reach is 75% is true. The probability of the claim being true is 0.2.

Therefore, the EV of return if M/S James bags the contract for all 5 years = 0.2*0.75*(5+15) = Rs. 3 crores.

Let us assume that M/S James's claim is false. The probability of the claim being false is 1-0.2 = 0.8.
Now, if the claim is false, Rajat will terminate the contract by the end of the year and will partner with M/S Jagan for the next 4 years.
Also, we have historic data that M/S James reaches 25% of the customers. Even if the claim is false, the laptops will reach 25% of the customers in the first year and 55% of the customers from the second year (Since M/S Jagan will bag the contract).

Therefore, the EV of profit in this case is 0.8*0.25*5+0.8*0.55*15 = 1 + 6.6 = Rs.7.6 crores.

Therefore, the total EV if M/S Bola bags the contract the first year is 3+7.6 = Rs.10.6 crores.

EV of choice 1 = Rs. 11 crores
EV of choice 2 = Rs. 11.3 crores
EV of choice 3 = Rs. 10.6 crores

Arranging the choices in terms of their EV, we get, Choice 2 > Choice 1 > Choice 3.

Option A:
Choice 1 is more profitable than Choice 2

Option B:
Choice 3 is more profitable than Choice 2

Option C:
Choice 3 is more profitable than Choice 1

As we can see, all three options are false. Therefore, option D is the right answer.

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