Answers and Explanations
to JTP's Free SHL-style Numerical Reasoning Test

Dear Candidate,

The test you have just completed provides a free glimpse to some of the many practice questions found in our online preparation packs for CEB's SHL-style tests.

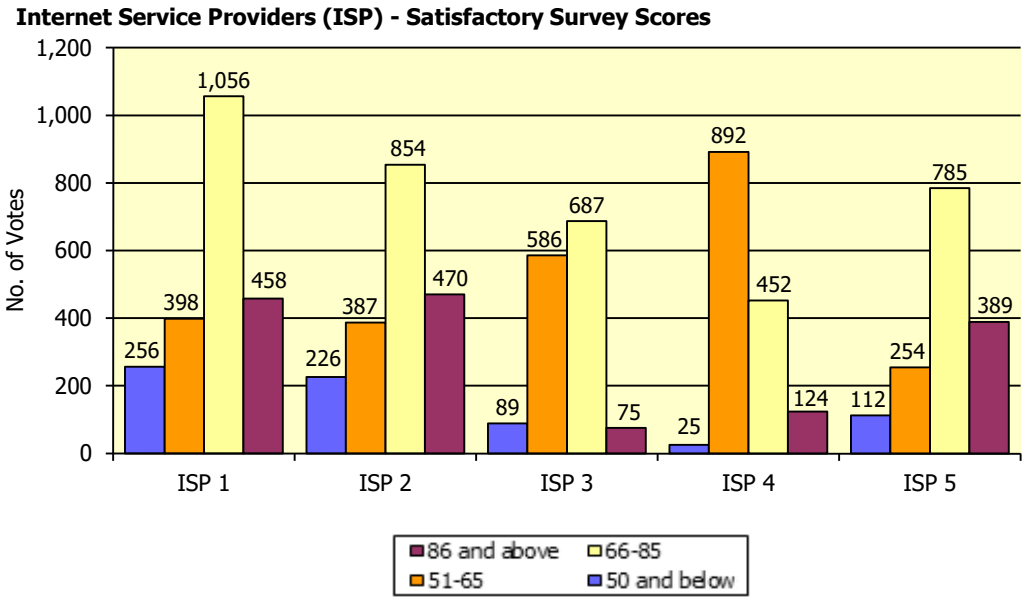
In this PDF you will find answers and detailed explanations to the test.
Take your time, carefully read the explanations and make sure you understand them.
We advise you to go over all of the questions (even those you got right), as you may learn new methods and shortcuts to answering them.

We also invite you to explore the list of links found at the end of this PDF, as they provide even more tips and useful information on CEB's SHL tests.

Wishing you the best of luck in your application process!

Job Test Prep

Question #1



What proportion of scores were 50 and below for ISP5?

A. 13.75%

B. 11.2%

C. 9.8%

D. 20%

E. 7.2%

The correct answer is (E).

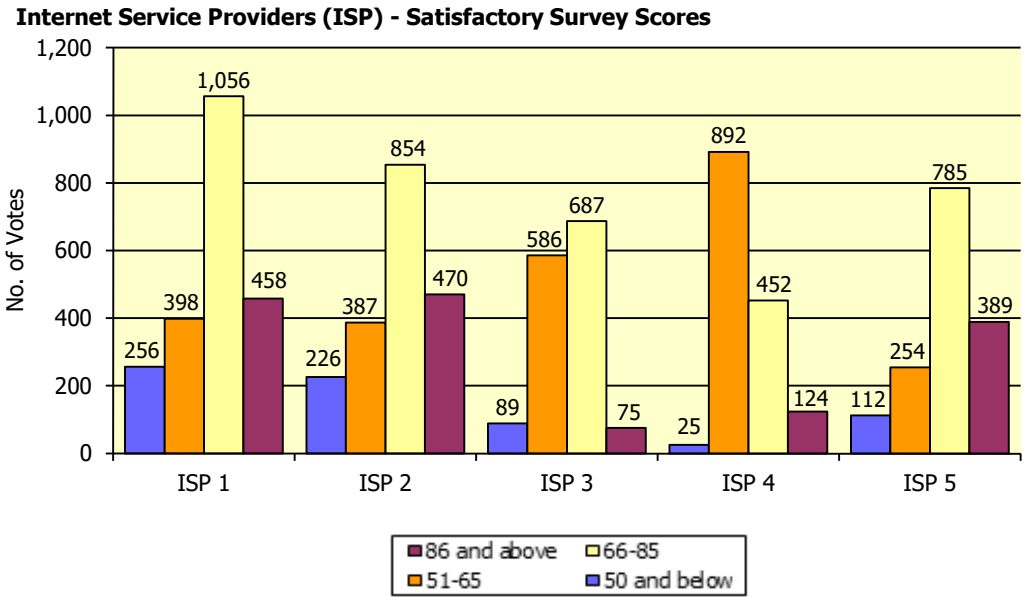
All we need to do in order to answer this question is to calculate the proportion of scores that were 50 and below for ISP5 using the following formula:

(# of scores of *50 and below* for ISP5 / total # of scores for ISP5) x 100 =

[112 / (112 + 254 + 785 + 389)] x 100 = 7.2%

This means that 7.2% of the scores given to ISP5 were 50 and below.

Question #2



Which ISP had the lowest percentage of scores of 86 and above?

A. ISP 1

B. ISP 2

C. ISP 3

D. ISP 4

E. ISP 5

The correct answer is (C).

We need to calculate the percentage of score of *86 and above* for each category according to the following formula:

(# of scores of *86 and above* for ISP / total # of scores for ISP) x 100

ISP 1: (458 / 2,168) x 100 = 21.1%

ISP 2: (470 / 1,937) x 100 = 24.3%

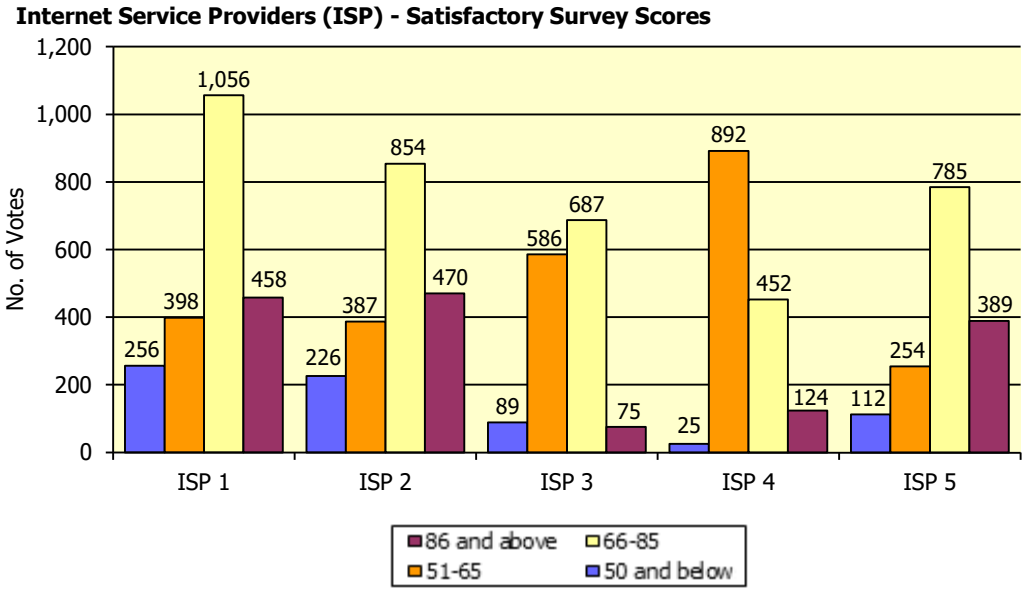
ISP 3: (75 / 1,437) x 100 = 5.2%

ISP 4: (124 / 1,493) x 100 = 8.3%

ISP 5: (389 / 1,540) x 100 = 25.3%

We can see that ISP 3 had the lowest percentage of scores of *86 and above*.

Question #3



What is the ratio of the number of scores above 50 and below 86 to the total number of scores in the survey?

A. 2.85:1

B. 1:3.85

C. 1:1.35

D. 3:4

E. None of the above

The correct answer is (C).

In order to answer this question, we need to carefully follow these steps:

1. Sum up **the number of scores <u>above</u> 50 and <u>below</u> 86**, i.e. the number of scores in the *51-65* category plus the number of scores in the *66-85* category: 398+387+586+892+254+1,056+854+687+452+785 = **6,351**
2. Sum up **the number of scores in the remaining categories** *(50 and below + 86 and above)*: 256+226+89+25+112+458+470+75+124+389 = **2,224**
3. Calculate **the total number of scores in the survey** by summing up the results: 6,351+2,224 = **8,575**

The ratio of the number of scores above 50 and below 86 to the total number of scores in the survey is 6351:8575 .

Since the result is not compatible with any of the options, we might be tempted to select the "None of the above" option. However, taking a careful look at the options, we can see that option (C) is in fact equal to our result, since dividing both sides of the ratio by 6,351 yields the result of 1:1.35.

Note: The same ratio can be expressed in numerous ways. In our case, the ratio of 6351:8575 can be expressed as 1:1.35, 0.74:1, 3:4.05 etc. Option (D) presents a ratio which is very close to the required ratio. However, since the ratio presented in option (C) is closer, this option is more accurate than option (D) and thus should be selected.

Question #4

At a certain cafe, three sandwiches, two pastries and four coffees cost the same as four sandwiches, one pastry, and two coffees. If one pastry plus two coffees cost £4 and two sandwiches plus one coffee cost £9, how much does one pastry cost?

A. £1
B. £2
C. £3
D. £4
E. £5

The correct answer is (B).

Let S represent the number of sandwiches, P the number of pastries and C the number of coffees. According to the question, the following is true:

(1) $3S + 2P + 4C = 4S + P + 2C$

(2) $P + 2C = 4$

(3) $2S + C = 9$

Equation 1 can also be represented as:

$3S + 2(P+2C) = 4S + (P+2C)$

Thus:

$3S + 2x4 = 4S + 4$

$3S + 8 = 4S + 4$

$S = 4$

Plugging back into equation 3:

$2S + C = 9$

$2x4 + C = 9$

$8 + C = 9$

$C = 1$

Plugging back into equation 2:

$P + 2C = 4$

$P + 2x1 = 4$

$P + 2 = 4$

$P = 2$

Therefore, one pastry costs £2.

Question #5

Space Laser LTD. Product Range (in millions of Pounds)					
Products	Total Cost per Unit			Sale Price per Unit	Profit per Unit
	Raw Materials	Manufacture	Calibration		
Houston A	13.4	2.4	0.34	35.3	19.16
Houston AA	16.2	2.7	0.75	39.2	19.55
Houston AA+	17.8	1.5	0.012	42.7	23.388
Ramon 1	24.1	4.5	0.92	63.4	33.88
Ramon 2	35.6	6.9	1.1	82.4	38.8

What is the approximate percentage change in profit per unit when a 12.5% discount is given for purchasing 150 units of Houston A?

A. 13

B. 16

C. 23

D. 18

E. 14

The correct answer is (C).

When a discount is given, *Profit per Unit* is reduced but *costs* remain constant.

The fixed costs are: (sale price - profit) = 35.3 - 19.16 = **£16.14**

The price after discount is: 87.5% x 35.3 = **£30.8875**

The new profit per unit is: 30.8875 - 16.14 = **£14.7475**

Therefore, the percentage change in profit is:

[1 - (new profit/old profit)] x 100 = 1 - (14.7475/19.16) x 100 = 23%

Notice that there is no need to consider 150 units, as a single unit is sufficient for calculating the loss in profit.

There is a shorter way to solve the question, if you realise the percentage change correlates with the discount value. Thus, we can calculate the absolute discount value: 35.3 x 0.125 = £4.4125, and divide it by the old profit per unit value: (4.4125/19.16) x 100 = 23%.

Question #6

Space Laser LTD. Product Range (in millions of Pounds)					
Products	Total Cost per Unit			Sale Price per Unit	Profit per Unit
	Raw Materials	Manufacture	Calibration		
Houston A	13.4	2.4	0.34	35.3	19.16
Houston AA	16.2	2.7	0.75	39.2	19.55
Houston AA+	17.8	1.5	0.012	42.7	23.388
Ramon 1	24.1	4.5	0.92	63.4	33.88
Ramon 2	35.6	6.9	1.1	82.4	38.8

What is the minimum number of Ramon 2 units that must be sold in order to equal the profit made from selling 25 Ramon 1 units, after a 13% increase in Ramon 1's profit?

A. 23

B. 24

C. 25

D. 26

E. 27

The correct answer is (C).

After a 13% increase, the profit from selling one unit of *Ramon 1* equals:

£33.88m x 1.13 = £38.2844m

Thus, the profit from selling 25 *Ramon 1* units equals:

25 x £38.2844m=£957.11m

We know that the profit from selling one unit of *Ramon 2* is £38.8m. Therefore, the minimum number of *Ramon 2* units that must be sold in order to equal 957.11 million pounds is: £957.11m/£38.8m = 24.66.

Since it is more than 24 units, it must be counted as 25.

Question #7

Space Laser LTD. Product Range (in millions of Pounds)					
Products	Total Cost per Unit			Sale Price per Unit	Profit per Unit
	Raw Materials	Manufacture	Calibration		
Houston A	13.4	2.4	0.34	35.3	19.16
Houston AA	16.2	2.7	0.75	39.2	19.55
Houston AA+	17.8	1.5	0.012	42.7	23.388
Ramon 1	24.1	4.5	0.92	63.4	33.88
Ramon 2	35.6	6.9	1.1	82.4	38.8

Which product has the highest calibration cost, relative to its total cost?

A. Houston A

B. Houston AA

C. Houston AA+

D. Ramon 1

E. Ramon 2

The correct answer is (B).

In order to answer the question, we need to follow 3 steps:

1. For each product, we need to find the total cost per unit = sale price per unit - profit per unit.
2. Next, we need to divide the calibration cost of each product by its total cost.
3. Finally, we need to look for the largest number (which represents the highest calibration cost relative to total costs).

Houston A: 0.34/(35.3-19.16) = 0.021

Houston AA: 0.75/(39.2-19.55) = 0.038

Houston AA+: 0.012/(42.7-23.388) = 0.0006

Ramon 1: 0.92/(63.4-33.88) = 0.031

Ramon 2: 1.1/(82.4-38.8) = 0.025

Therefore, *Houston AA* has the highest calibration cost relative to its total cost.

Question #8

Marsha is responsible for buying writing supplies for the office. Paper is £20 per box, pencils are £10 per package and pens are £35 per package. When Marsha goes to buy the supplies, she discovers that there is a 10% off sale on pens. If Marsha has £300 to spend on supplies, and she must buy one box of paper for every package of pencils or pens, and more packages of pencils than packages of pens, what is the greatest number of packages of pens that Marsha can buy?

A. 0
B. 1
C. 2
D. 3
E. 4

The correct answer is (D).

In order for Marsha to buy the greatest number of pens, she needs to buy the smallest number of pencils and paper:

1. We know that Marsha has to buy one box of paper for every package of pens/pencils she buys. Therefore, for her to buy the smallest number of paper, she needs to buy one package of paper for each package of pencils/pens (and no more than that).
2. We also know that Marsha has to buy more pencils than pens. Thus, in order to buy the minimum number of pencils, she has to buy one more package of pencils than pens.

According to (1), we can say that Marsha has to buy combos of pencils + paper and pens + paper at a maximum price of £300 .

A pencils + paper combo will cost £30, and a pens + paper combo will cost £51.50 (Pens are 10% off, so they cost £31.50 instead of £35.).

Now, we can calculate the maximum number of pens as follows:

0x(pens+paper)+1x(pencils+paper)=0x£51.50+1x£30=£0+£30=£30

1x(pens+paper)+2x(pencils+paper)=1x£51.50+2x£30=£51.50+£60=£111.50

2x(pens+paper)+3x(pencils+paper)=2x£51.50+3x£30=£103+£90=£193

3x(pens+paper)+4x(pencils+paper)=3x£51.50+4x£30=£154.50+£120=£274.50

4x(pens+paper)+5x(pencils+paper)=4x£51.50+5x£30=£206+£150=£356

Since 4 pens (+ paper) and 5 pencils (+ paper) costs more than £300, the maximum number of pens that can be bought is 3.

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