DOKA Paper S (for Year Level 7-8)

Sample Questions

(Part A - Basic Reasoning)

During a clearance sale, Mr. Tan who works as a tutor, bought a total of 28 English and Mathematics assessment books for $350. The cost of an English assessment books was $15 and the cost of a Mathematics assessment book was $8. Find the amount (in $) spent on Mathematics assessment books.

Solution:

Making Assumption Method

"Difference of price between 1 Maths book and 1 English book is $7"

Assume all books are Mathematics:
28 x $8 = $224
$224 < $350
Difference if all are Maths books: $350 – $224 = $126
Difference if 27 are Maths books and 1 is English book : $126 + $7(1)
Difference if 26 are Maths books and 2 are English books: $126 + $7(2)
Difference if 25 are Maths books and 3 are English books: $126 + $7(3)
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Hence $126 ÷ $7 = 18 English books
28 – 18 = 10 Maths books
10 Maths books = 10 x $8
= $**80**

Check: 10 x $8 + 18 x $15 = $350 (Correct)

(Part B - Intermediate Reasoning: NVR)

What is the correct answer to be written in the blank space in the following series?

EHP GKM DNJ FQG ___

A. CTD
B. CTE
C. BCD
D. BCE
E. CSD

Solution:

First letters are E G D F (forward 2 backward 3). Hence next letter is C.
Second letters are H K N Q (forward 3 letters). Hence next letter is T.
Third letters are P M J G (backward 3 letters). Hence next letter is D.

CTD is the answer. Therefore, we choose option **A**.

(Part C - Advanced Reasoning)

Leap years occur every 4 years. The leap day, 29 February, occurred on a Friday in 2008. What day of the week is 29 February 2020?

Solution:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					29-2-08	1-3-08
1-3-09	1-3-10	1-3-11		1-3-12	1-3-13	1-3-14
1-3-15		1-3-16	1-3-17	1-3-18	1-3-19	
1-3-20						

By continuing the pattern of the dates, we can see 1-3-20 falls on a Sunday.

Basic concept:

- Since 29-2-08 is a Friday, then 1-3-08 must be a Saturday.
- 1 non-leap year has 365 days or **52 weeks + 1 day**
- Today is Saturday, and take today as the 1st day of the non-leap year, then on the last day of this year, it will be the 365th day. That means, on the 1st day of next year, in other words, we can say the position is 366th.
- 366th is 365 days after 1st

Use the table above and solve it:

1-3-09 is **'52 weeks + 1 day'** after 1-3-08

1-3-10 is **'52 weeks + 1 day'** after 1-3-09

1-3-11 is **'52 weeks + 1 day'** after 1-3-10

1-3-12 is **'52 weeks + 2 days'** after 1-3-11 (in between there is one extra day, that is 29th Feb)

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By continuing the pattern of the dates, we can see 1-3-20 falls on a Sunday.

Therefore, 29-2-20 will be a **Saturday**.

(Part D - Extended Reasoning)

By using digits 1, 3, 5, 7 and 9, we can form a five-digit number without repetition of any digit. What is the sum of all such possible numbers? Divide your result by 1000, then round off to the nearest one, that will be your final answer.

Solution:

There are 5 digits to be used. Each digit must be used one time. Some examples are:
13579, 15379, 97351, 37951, 79351.

If we fix 1 at the one's place, the other digits can be arranged in 4! = 4 x 3 x 2 x 1 = 24 ways.
So there are 24 numbers which have 1 at the one's place and these digits (24 times of 1) sum to 24.

Similarly, there will be 24 numbers **each** with 3, 5, 7 and 9 at the one's place. So, the sum of all the digits at the one's place will be:

$$(1 \times 24) + (3 \times 24) + (5 \times 24) + (7 \times 24) + (9 \times 24)$$
$$= 25 \times 24$$
$$= 600$$

Using the same concept, the sum of the digits at the ten thousand's place/ thousand's place/ hundred's place/ ten's place will be 600 too.

The sum of all possible numbers

$$= 600 \text{ ten thousands} + 600 \text{ thousands} + 600 \text{ hundreds} + 600 \text{ tens} + 600 \text{ ones}$$
$$= 600\ (10000 + 1000 + 100 + 10 + 1)$$
$$= 6\ 666\ 600$$

$6\ 666\ 600 \div 1000 = 6\ 666.6 =$ **6667** (to the nearest one)