

SCHOOL:

Eastern Area Final Mathematical Challenge 2010

Round 4 MULTIPLE CHOICE (30 marks)

(circle the correct answer)

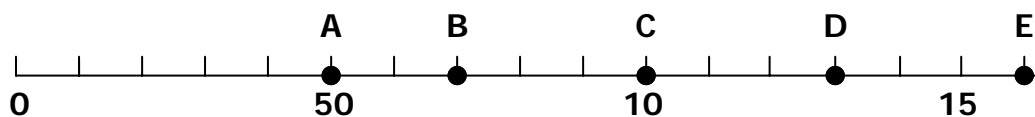
1. In the province of Duffle Cote, four tiggles are equal in value to three toggles; two toggles are equal in value to five taggles, and six taggles are equal in value to one tuggle. Which is the smallest?

- A** 1 tuggle **B** 2 toggles **C** 3 taggles **D** 4 tiggles
E two have the same value

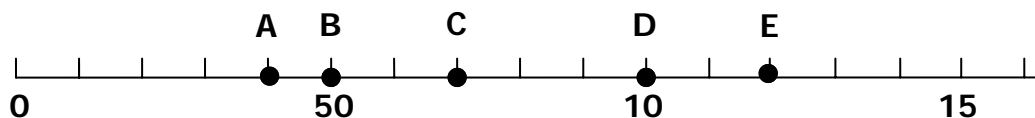
2. The pattern 123451234512345..... is continued to form a 2010-digit number. What is the sum of all 2010 digits?

- A** 6030 **B** 7530 **C** 30030 **D** 60030 **E** 75030

3. The population of five towns A, B, C, D, E in 2000 and 2010 are shown on these scales.



2010 population in thousands



2000 population in thousands

Which of the five towns showed the largest percentage increase in population from 2000 to 2010?

- A** **B** **C** **D** **E**

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4. The first six volumes of the *Encyclopedia of Mathematicians* are arranged in order on my shelf from left to right. The six volumes contain names beginning A-Ba, Be-Ca, Ce-Ei, Ek-Fe, Fee-Fi, Fo-Fum. If one ignores the covers, which of the following encyclopedia entries could be on a page “next to” the page with the entry Einstein?

A Abel **B** Bernoulli **C** Cantor **D** Euler **E** Fibonacci

5. The probability of a single ticket winning the jackpot in the National Lottery is

$$\frac{6}{49} \times \frac{5}{48} \times \frac{4}{47} \times \frac{3}{46} \times \frac{2}{45} \times \frac{1}{44}$$

If I buy one ticket every week, approximately how often might I expect to win the jackpot?

- A** One every hundred years
B once every twenty thousands years
C once every hundred thousand years
D once every quarter of a million years
E once every million years

6. When exactly is the value of the product

$$\left(1 + \frac{1}{2}\right) \left(1 + \frac{1}{3}\right) \left(1 + \frac{1}{4}\right) \dots \dots \dots \left(1 + \frac{1}{n}\right)$$

equal to an integer?

- A** when n is odd **B** when n is even **C** when n is a multiple of 3
D always **E** never