Arithmetic
Paper I – Question 1

It is important to be able to use a calculator properly.

Numbers

You must be able to use fractions properly. *Example:* calculate $\frac{2}{3}$ of $360 + \frac{2}{5}$ of 425

You must understand and be able to use percentages. *Example:* find 24% of 8950

You must be able to deal with ratios and proportions. *Example:* divide €84 between three people in the ration 2 : 4 : 1

You need to be able to use scientific notation. *Example:* simplify $3.8\times10^{-4} + 9.3\times10^{-5}$

You must be able to calculate error and percentage error when one number is given as an approximation for another. *Example:* find the percentage error when 4 is taken as an approximation for 3.94

$$\%\ \text{Error} = \frac{\text{Error}}{\text{Actual Value}} \times 100$$

Money

You must be able to convert one currency to another. *Example:* €1 = $0.87, what is $50 in €?

Calculating the profit, loss, percemtage profit/loss, and discounts. *Example:* If I sell for €570 an object that I previously purchased for €450, what percentage profit have I made?

You must know how to make tax calculations (VAT and income tax). *Example:* A person with a Tax Free Allowance of €6 500 pays tax at the rate of 24% on all her taxable income; what is her take-home pay if her gross income is €20 000?

$$\text{Gross tax} = \text{Gross income} \times \frac{\text{rate}}{100}$$

$$\text{Tax payable} = \text{Gross tax - Tax credits}$$

$$\text{Net income} = \text{Gross income - Tax Payable}$$

You must be capable of making compound interest calculations. *Example:* If €5 000 is invested at 4% per annum compound interest, what is it worth in five years time?

$$A = P\left(1 + \frac{r}{100}\right)^n *$$

Where: A is the final amount
P is the principle amount (beginning)
r is the rate of interest
and n is the number of years

**Note: this formula is not that useful as often the rate of interest changes year after year.*

Time, Distance and Speed

You must be able to use time when given in the 24 hour clock. E.g. 1735

Know how to calculate average speed:

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

Example: If a man starts at 0747 and arrives at 0924 the same day, having travelled 194 km, what is his average speed?

Note: Do not forget the UNITS!