Introduction, Approximation & Error in Computation

1. **WAP to generate and print π, e & φ correct up to 50 decimal places.**

$$\frac{\pi^2}{6} = \sum_{n=1}^{\infty} \frac{1}{n^2}$$

$$e = \lim_{n\to\infty} \left(1 + \frac{1}{n}\right)^n$$

$$\varphi = \frac{1 \pm \sqrt{5}}{2}$$

$\pi = 3.14159265358979323846264338327950288419716939937510$

$e = 2.71828182845904523536028747135266249775724709369995$

$\varphi = 1.61803398874989484820458683436563811772030917980580$ or,

$\varphi = -0.61803398874989484820458683436563811772030917980576$

2. **WAP to print Planck's constant $(6.62607004 \times 10^{-34} \text{ m}^2.\text{ kg}.\text{s}^{-1})$, Gravitational constant $(6.67408 \times 10^{-11} \text{ m}^3.\text{kg}^{-1}.\text{ s}^{-2})$, Permeability in free space $(4\pi \times 10^{-7}\text{m}.\text{kg}.\text{s}^{-2}.\text{A}^{-2})$, Permittivity in free space $(8.85418 \times 10^{-12}F.m^{-1})$, Electronic charge $(1.60217662 \times 10^{-19}\text{C})$ in engineering & scientific notation. In engineering notation power is multiple of 3 whereas it is not necessary in scientific notation.**

3. **Round off a number to nth significant figure and calculate rounding error.**

4. **Truncate a number to nth significant figure and calculate truncating error.**

5. **Find absolute and relative error in writing**
   a. $3! = 3.0000001!$
   b. $3!! = 3.0000001!!$
   c. $e^6 = \pi^4 + \pi^5$
   d. $3753^3 = 3230^3 + 2676^3$
   e. $299792458 = 3 \times 10^8$