O/L Examination, December 2008

9. (i) A right circular cylindrical vessel with internal base radius 7 cm and height 15 cm is filled with water up to a height of 10 cm. Calculate the volume of the water. (Take $\pi = \frac{22}{7}$)

(ii) When 18 small solid metal spheres of radius a cm, are put into the above vessel, its water level goes up by h. Show that $h = \frac{24a^3}{49}$ cm.

(iii) Using logarithms, find the value of h to one decimal place when a = 1.75.

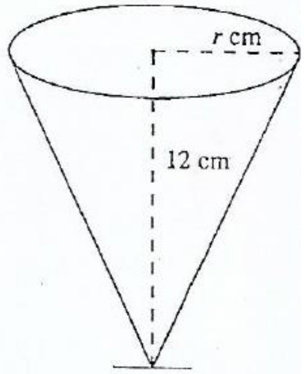
O/L Examination, December 2009

5. A conical shaped glass vessel of base radius r cm and height 12 cm was kept as shown in the figure and filled with water.

(i) Show that the volume of water in the glass vessel is $4\pi r^2$ cm^3.

(ii) The water in the vessel is now poured into an empty cubic shaped vessel that has a square base of side a cm. The water fills the cubic shaped vessel up to a height of b cm. Show that $a^2 = \frac{4\pi r^2}{b}$.

(iii) Taking that $4\pi = 12.56$, $r = 9.57$ and $b = 18$, and using logarithmic tables, find the value of a^2 to the nearest whole number and then obtain the value of a.



O/L Examination, December 2010

6. (a) A prism with cross-sectional area a² and height b is made out of the metal obtained by melting a solid metal cylinder of base radius a and height 2a, without any wastage of metal.

(i) Obtain the volume of the cylinder in terms of a

(ii) Show that the height of the prism, b = 2πa

(b) Using logarithm tables, simplify : $\frac{(7.432)^2 \times 0.253}{2.343}$

O/L Examination, December 2011

12. (a) The height of a solid right circular metal cone of base radius a is 3a.

(i) Show that the volume of the cone is πa^3

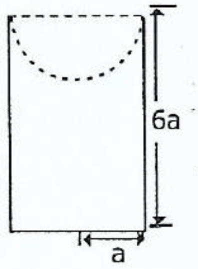
(ii) Find how many solid spheres of radius $\frac{a}{2}$ can be made without waste from the metal obtained by melting the cone.

(iii) Find the volume of one such metal sphere in terms of a.

(b) Simplify by using the logarithm tables : $\frac{0.523 \times \sqrt{763.5}}{(1.35)^2}$

O/L Examination, December 2012

6\. (a)A solid hemispherical portion of radius **a** is carved away from **a** solid right - circular wooden cylinder of base radius **a** and height 6a. Show that the remaining volume of wood in the cylinder is equal to the volume of 4 solid spheres each of radius **a**.



(b) Simplify $\dfrac{0.735 \times \sqrt{52.62}}{(1.84)^2}$ using logarithmic tables and give the answer to **two** nearest decimal places. .

O/L Examination, December 2013

6\. (a) A container of the shape of a cuboid with a square bottom of each side **3a** centimetres and height **h** centimetres, is filled with water to a height of **x** centimetres from the bottom.

(i) Write an algebraic expression for the volume of water (in cubic centimetres) in the container, in terms of **a** and **x**.

A solid right circular cylinder of base radius **a** centimetres and height **a** centimetres is completely immersed in the water of the above container.

(ii) Find the volume (in cubic centimetres) of the cylinder in terms of **a** and π.

(iii) If the water of the container reaches the spilling level after immersion of the cylinder, then show that **9(h - x)** π**a.**

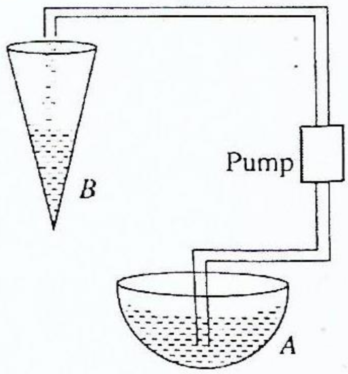
(b) Simplify using the logarithmic tables: $\dfrac{\sqrt{0.0463}}{(1.08)^2} \times 34.83$

O/L Examination, December 2014

6\. (*a*) Water is pumped at a constant rate of 6 cubic centimetres per second from a hemispherical container A filled to its full capacity, into an empty container B of the shape of a right circular cone. The height of the container B is 14 cm. Use $\frac{22}{7}$ for π in the following calculations.

(i) If the container B is filled to its full capacity in 22 seconds, show that the capacity of the container B is 132 cm^3 and find its radius.

(ii) The pump keeps working even after the container B is full. If the radius of the container A is r centimetres, show that the total time it takes to empty the container A is $\frac{22}{63}r^3$ seconds.



(*b*) Find the value, using logarithmic tables: $1.52 \times \sqrt{415}$