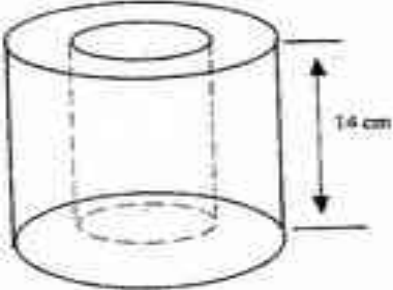


NAME _____ INDEX NUMBER _____

SCHOOL _____ DATE _____

APPROXIMATIONS AND ERRORS

<i>KCSE 1989 – 2012 Form 3 Mathematics</i>	Working Space
<p>1. 1996 Q 15 P1</p> <p>The figure below represents a hollow cylinder. The internal and external radii are estimated to be 6 cm and 8 cm respectively, to the nearest whole number. The height of the cylinder is exactly 14 cm.</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>(a) Determine the exact values for internal and external radii which will give maximum volume of the material used. (1 mark)</p> <p>(b) Calculate the maximum possible volume of the material used. Take the value of π to be $\frac{22}{7}$ (2 marks)</p>	
<p>2. 1997 Q 16 P1</p> <p>(a) Work out the exact value of $R =$</p> $\frac{1}{0.003146 - 0.003130}$ <p>(b) An approximate value of R may be obtained by first correcting each of the decimal in the denominator to 5 decimal places</p> <p>(i) The approximate value</p> <p>(ii) The error introduced by the approximation</p>	

		Working Space
3.	<p>1998 Q 15 P1 The radius of circle is given as 2.8 cm to 2 significant figures</p> <p>a) If C is the circumference of the circle, determine the limits between which $\frac{C}{r}$ lies</p> <p>b) By taking π to be 3.142, find, to 4 significant figures the line between which the circumference lies.</p>	
4.	<p>1999 Q 9 P1 The length and breadth of a rectangular floor were measured and found to be 3.1m and 2.2 m respectively. If possible error of 0.01 m was made in each of the measurements, find the:</p> <p>(a) maximum and minimum possible area of the floor</p> <p>(b) Maximum possible wastage in carpet ordered to cover the whole floor</p>	
5.	<p>2000 Q 10 P1 The length and breadth of a rectangular paper were measured to be the nearest centimeter and found to be 18cm and 12 cm respectively. Find the percentage error in its perimeter.</p>	
6.	<p>2002 Q 8 P2 The sides of a triangle were measured and recorded as 8cm, 10cm and 15cm. Calculate the percentage error in perimeter, correct to 2 decimal places.</p>	

		Working Space
7.	<p>2005 Q 9 P1</p> <p>In this question Mathematical Tables should not be used</p> <p>The base and perpendicular height of a triangle measured to the nearest centimeter are 6 cm and 4 cm respectively.</p> <p>Find</p> <p>(a) The absolute error in calculating the area of the triangle (2marks)</p> <p>(b) The percentage error in the area, giving the answer to 1 decimal place (2marks)</p>	
8.	<p>2006 Q 4 P2</p> <p>By correcting each number to one significant figure, approximate the value of 788×0.006. Hence calculate the percentage error arising from this approximation.</p> <p>(3 marks)</p>	
9.	<p>2007 Q 8 P2</p> <p>A rectangular block has a square base whose side is exactly 8 cm. Its height measured to the nearest millimeter is 3.1 cm. Find in cubic centimeters, the greatest possible error in calculating its volume.</p> <p>(2 marks)</p>	
10	<p>2008 Q 5 P2</p> <p>The top of a table is a regular hexagon. Each side of the hexagon measures 50.0 cm. Find the maximum percentage error in calculating the perimeter of the top of the table.</p> <p>(3marks)</p>	

		Working Space
11	<p>2010 Q 1 P2</p> <p>The length and width of a rectangle measured to the nearest millimeter are 7.5cm and 5.2cm respectively.</p> <p>Find, to four significant figures, the percentage error in the area of the rectangle. (3 marks)</p>	
12	<p>2011 Q 9 P2</p> <p>The radius of a spherical ball is measured as 7cm, correct to the nearest centimeter. Determine to 2 decimal places, the percentage error in calculating the surface area of the ball. (4 marks)</p>	
13	<p>2012 Q11 P2</p> <p>The base and height of a right angled triangle were measured as 6.4cm and 3.5cm respectively. Calculate the maximum absolute error in the area of the triangle. (3 marks)</p>	

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