


<p>Department of Basic Science Level: 1 Examiner: Dr. Mohamed Eid Time allowed: 3 hours</p>	 <p>Pyramids higher Institute P.H.I. For Engineering And Technology معهد الأهرامات العالي للهندسة و التكنولوجيا</p>	<p>Prep. Year: Final Exam Course: Mathematics 2 Course Code: BAS 013 B Date: August 29, 2016</p>
<p>The Exam consists of one page Answer all questions No. of questions: 5 Total Mark: 70</p>		
<p><u>Question 1</u> Find y' from the following: (a) $y = 2 + 2^x + 2^{x^3}$ (b) $y = x^4 \cdot \sinh x^4$ (c) $y = \log x \cdot \tanh x$ (d) $y = \tan^{-1} x + \tanh^{-1} x$ (e) $y = t \cdot \ln t$, $x = t \cdot e^t$ (f) $y^4 = x + \ln(x - y)$</p>	<p>18</p>	
<p><u>Question 2</u> Find the following integrals: (a) $\int (x^3 + \frac{1}{x^3} + 3^x) dx$ (b) $\int (\frac{x}{1+x^2} + \frac{1}{\sqrt{1+x^2}}) dx$ (c) $\int (2 - \sqrt{x})^2 dx$ (d) $\int (\frac{1}{x+1} + \frac{1}{1+x^2}) dx$ (e) $\int e^x (3 + e^x)^7 dx$ (f) $\int x \ln x dx$ (g) $\int (3 + \cosh x) dx$ (h) $\int \sin^4 x dx$ (i) $\int \frac{x+2}{x^2-4x+3} dx$</p>	<p>18</p>	
<p><u>Question 3</u> (a) Find the area of the region between the curve $y = x^3 - 8$, x-axis, x in $[1, 3]$. (b) If the region between the curve $y = 1 + x^3$, x-axis, x in $[1, 2]$ is rotated about (i) x-axis (ii) y-axis. Find the volume of the generated solids V_x and V_y. (c) Find the length of the curve $y = \frac{2}{3} x \sqrt{x}$, x in $[1, 2]$.</p>	<p>4 8 4</p>	
<p><u>Question 4</u> (a) State the definition of the plane. (b) Find the angle between the planes $x - 2y + 2z + 5 = 0$, $3x - 4z - 1 = 0$. (c) Write the equation of the plane that passes through the points: $(1, 3, 2)$, $(-1, 0, 4)$, $(2, 0, 4)$.</p>	<p>2 3 5</p>	
<p><u>Question 5</u> (a) Find the angle between the lines : $x = -3t + 1$, $y = 4t + 1$, $z = 3$ and $x = \frac{y-1}{2} = \frac{z+1}{-2}$ (b) Write the equation of the plane that passes through the point $(0, -1, 3)$ and its normal vector $\vec{N} = 2\mathbf{i} - 3\mathbf{j} + \mathbf{k}$. (c) Write the name of each surface: (i) $x^2 + y^2 + z^2 - 2x - 3 = 0$ (ii) $z^2 = x^2 + 3y^2$ (iii) $y^2 + 3z^2 = 4$ (iv) $x^2 + 2z^2 = y^2$</p>	<p>2 2 4</p>	