


Department of Basic Science Level: 1 Examiner: Dr. Mohamed Eid Time allowed: 3 hours	 P.H.I. For Engineering And Technology معهد الأهرامات العالي للهندسة و التكنولوجيا	Prep. Year: Final Exam Course: Mathematics 1 Course Code: BAS 013 A Date: August 29, 2016
The Exam consists of one page Answer all questions No. of questions: 5 Total Mark: 70		
<u>Question 1</u> Find y' from the following: (a) $y = 2x^3 - 3 \cos x$ (b) $y = x^4 \cdot \sin x$ (c) $y = \tan x^2 + \tan^2 x$ (d) $y = (x^3 + 2)^{-6}$ (e) $y = \frac{3}{4} - \frac{5}{x^4}$ (f) $y = \frac{x}{3} + \frac{2}{\cot x}$		18
<u>Question 2</u> Find the limits: (a) $\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{16 - x^2}$ (b) $\lim_{x \rightarrow 0} \frac{x - \sin x}{x^2 + \tan 2x}$ (c) $\lim_{x \rightarrow 0} \frac{\sin 2x}{x^2 - x}$ (d) $\lim_{x \rightarrow \infty} \frac{x + 2x^5}{1 + x^5}$		8
<u>Question 3</u> (a) Find the extrema of each function : (i) $f(x) = x^4 - 2x^2$ (ii) $g(x) = 1 - x^3$ (b) Write the Maclurin's expansion of the function : $f(x) = x \cdot \sin x$.		10 4
<u>Question 4</u> (a) State the definition of the hyperbola. (b) Write the equation of circle with center $(1, -2)$ and radius 3. (c) Show that the following circles are orthogonal and find the radical axis : $x^2 + y^2 + 2x + 4y - 2 = 0$, $x^2 + y^2 - 4x + 3y + 4 = 0$.		3 4 8
<u>Question 5</u> (a) State the definition of the ellipse. (b) Find the angle between the lines: $x^2 - 3xy + 2y^2 = 0$ and separate them. (c) Write the equation of line which passes through the points : $(3, 1)$, $(1, -2)$. (d) Find center, vertices and sketch the parabola: $x^2 - 4x + 4y + 12 = 0$.		2 4 4 5

Good Luck,

Dr. Mohamed Eid