


Ministry Of Higher Education Higher Institute of Engineering October 6 City Department of Basic Science	 مدينة الثقافة و العلوم	Prep. Year: Final Exam Mathematics: (Calculus I) Course Code: BAS 111 Date: September, 2013	
الزمن: 3 ساعات	الامتحان (5) أسئلة في صفحة واحدة و المطلوب الإجابة عن كل الأسئلة		Marks
[1] Find y' from the following: (a) $y = 3x^2 + \cos x$ (b) $y = 4^x \cdot \sin x$ (c) $y = \cosh x + \log x$ (d) $y = 3x + \tan^{-1}x$ (e) $y = \ln x + \sin^{-1}x$ (f) $y = (2^x + \tan x)^8$			12
[2] Find y' where (a) $y = 3 + \sin^3x$ (b) $y = x \cdot \ln x + \log x$ (c) $y = \frac{x^3}{x + \sinh x}$ (d) $y = x^{\sin x}$ (e) $y = t^2 + \sin t, \quad x = t^{-3} + 4t + 2$			15
[3] Determine the maximum, minimum and inflection points of the functions: (a) $f(x) = x^3 - 3x + 1$ (b) $f(x) = x^3 + 2$ (c) $f(x) = 3 + 2x$			10
[4] Find the following integrals: (a) $\int (3x^2 + 4^x) dx$ (b) $\int \left(\frac{1}{x^2} + \frac{2x}{1+x^2} \right) dx$ (c) $\int 2x(1 + x^2)^9 dx$ (d) $\int x \cdot \cos x dx$ (e) $\int \ln x dx$ (f) $\int (\sin 3x + \cos^2 x) dx$			12
[5](a) Compute the integral $\int_1^2 \frac{x}{x^2+3x+2} dx$ (b) Find the area of the region between the curve $y = (x^2 + 3)^2$, x-axis, x in [0, 1] (c) If the region between the curve $y = 1 + x$, x-axis, x in [0, 1] is rotated about (i) x-axis (ii) y-axis. Find the volume of the generated solid in both cases.			4 3 4

Good Luck

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