Basic Science Department Mathematics I Code: Math 101 Final Exam: May 2014 Time Allowed: **2** Hours	Modern University For Technology & Information Faculty of Engineering	Academic year: 2013 / 2014 Semester: Spring Examiners: Dr. Mona Samir Dr. Mohamed Eid
Answer **All** Questions		No. of Questions: 4 Total Mark: 40

ممنوع إستخدام المحمول كألة حاسبة. يُسمح **فقط** بإستخدام الألة الحاسبة العادية

Do not use Mobile as Calculator. Only use regular Calculator

Question 1

(a)Find any maximum, minimum and inflection points of the function : 4

$f(x) = 2x^3 - 15x^2 + 24x$

(b)Find the Maclaurin series for the function: $f(x) = \ln(1-x)$. 2

(c) Evaluate: $\lim_{x\to 1}(1-x).\tan\left(\frac{\pi x}{2}\right)$. 2

Question 2

12

Find $\frac{dy}{dx}$

(a) $y = sin^4(lnx^5) - \coth(4^{x^7})$ (b) $y = sech^{-1}(x.log_5 x^3) + \sqrt[4]{x^3+25}$

(c) $e^{x^2+y^2} - tan^{-1}(y^3) = cosx^2$ (d) $y = \frac{cosec\,h^{-1}(3x) - \tan(5x)}{x+4}$

Question 3

Find the integrals: 10

(a) $\int(2x^2 - 3^x)\,dx$ (b) $\int(\frac{1}{x} + \frac{1}{x-3})\,dx$ (c) $\int(\sin 3x \,.\sin x)\,dx$

(d) $\int(x + \frac{1}{x})^2\,dx$ (e)$\int(\frac{2x}{\sqrt{1+x^2}} + \frac{1}{1+x^2})\,dx$ (f) $\int \tan^{-1} x\,dx$

Question 4

(a) Find the integrals: (i)$\int \frac{x+2}{x^2+4x+3}\,dx$ (ii) $\int cos^5 x\,dx$ 4

(b)Find the area of region bounded by $y = x^2 - 2x$, x-axis, x in [0, 3] 3

(c)Find the volume V_y of the solid generated by rotating the region between 3

$y = 2^x$, x-axis, x in [1, 2] about y-axis.

Good luck *Dr. Mona Samir* *Dr. Mohamed Eid*

Engineering Mathematics Department Math. I Code: Math 101 Mid-Term Exam: April 2014 Time Allowed: **60** Minuets	Modern University For Technology & Information Faculty of Engineering	Academic year: 2013 / 2014 Semester: Spring Examiners: Dr. Mona Samir Dr. Mohamed Eid
Answer All Questions		Total Mark: 30

ممنوع إستخدام المحمول كألة حاسبة. يُسمح **فقط** بإستخدام الألة الحاسبة العادية

Differentiation: Answer in a separate paper

Find $\frac{dy}{dx}$ — 15

(1) $y = \ln\left(\coth(x.e^{x^{3+5x}})\right) + e^{\operatorname{sech}(x^2-5)}$

(2) $y = \log_6(x^2-3x)^7 + \sin^{-1}(x^4)$

(3) $y = x^{x^2} + x^x$

(4) $y = 5^{x^4} + \sqrt[5]{\operatorname{cosech} 2x + \tan^{-1}(\cos(5x))}$

(5) $\tan^6 xy + 7x^2 + y^3 = \operatorname{sech}^{-1}(x^3y^5)$

Integral: Answer in a separate paper

Find the integrals:

(1) $\int (2x^2-5)\,dx$ — 6

(2) $\int (\frac{1}{x} + \cos 3x)\,dx$ — 6

(3) $\int (\frac{1}{x^3} + \sin 3x)\,dx$ — 3

(4) $\int (3^x - 2^x)^2\,dx$

(5) $\int \frac{x}{x^2-x-6}\,dx$

(6) $\int (\sin 3x \,.\, \cos 2x)\,dx$

(7) $\int cos^4 x\,dx$

Good luck *Dr. Mona Samir* *Dr. Mohamed Eid*