

Academic Year: 2012 – 2013 Semester: Autumn Date: 31 – 12 – 2012 Duration Time: 2 Hours	 Modern University For Technology & Information Faculty of Pharmacy	Mathematics: OCM 103 Final Exam Examiner: Dr. Mohamed Eid
Answer All Questions		Total Mark: 35
[1] Find y' where: (a) $y = 3x^3 + 3^x + 3$ (b) $y = \cos x \cdot \log x$ (c) $y = [\sin x + \ln x]^8$ (d) $y = \frac{3}{\sin x} + \left(\frac{2}{3}\right)^x$		6
[2] Find the integrals: (a) $\int \left(x^2 + \frac{1}{x^2} + \frac{1}{x}\right) dx$ (b) $\int (3^x + \cos x) dx$ (c) $\int (x \cdot \ln x) dx$ (d) $\int \frac{x}{x^2 - 3x - 4} dx$ (e) $\int_2^3 (3x^2 + 1) dx$		10
[3](a) If $A = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 & 1 \\ 2 & 1 & 2 \end{bmatrix}$. Find, if possible, $A \cdot B$, A, $A + B$, $A \cdot A^t$, $A \cdot B^t$, $A \cdot B^t$.		6
(b) Write the linear system in matrix form and determine the type of solution: $2x - y = 1$, $4x - 2y = 2$.		4
[4](a) Write the matrix of the chemical compound and find the eigenvalues: $\text{CH}_3 - \text{C} \equiv \text{CH}$		4
(b) If a drug exists in 3 dosage forms : First type of concentration: 1 mg / tablet Second type of concentration: 2 mg / tablet Third type of concentration: 4 mg / tablet If the pharmacist wanted to produce 10 tablets containing 3 mg / tablet by mixing whole tablets. Find all possible solutions.		5

Good luck

Dr. Mohamed Eid

Name:		الاسم:	
Group 1: A, B	Sec:	ID:	Serial:

Find y' , where

(1) $y = 2^x + 3x^2$

(2) $y = \sin x \cdot \log x$

(3) $y = (2 + \cos x)^5$

(4) $y = 2^{-x} + \frac{1}{2}$

(5) $y = \frac{\cos x}{\sin x}$

Name:		الاسم:	
Group 1: C, D	Sec:	ID:	Serial:

Find y' , where

(1) $y = 3^x + 3 \cos x$

(2) $y = x^3 \cdot \log x$

(3) $y = (2 + 2^x)^6$

(4) $y = 3^{-x} + \frac{1}{3}$

(5) $y = \frac{\sin x}{\ln x}$

Name:		الاسم:	
Group 1: E, F	Sec:	ID:	Serial:

Find y' , where

(1) $y = 3 \sin x - 7 \log x$

(2) $y = 3^x \cdot x^3$

(3) $y = (x + \sin x)^5$

(4) $y = 4^{-x} + \frac{1}{4}$

(5) $y = \frac{\log x}{\sin x}$

Name:		الاسم:	
Group 1: G	Sec:	ID:	Serial:

Find y' , where

(1) $y = \cos x + 4 \ln x$

(2) $y = x^3 \cdot \sin x$

(3) $y = (3^x - 3)^{-3}$

(4) $y = 3^{2x} + 8x$

(5) $y = \frac{\sin x}{x + \cos x}$

Name:		الاسم:	
Group 2: H, I	Sec:	ID:	Serial:

Find y' , where

$$(1) y = 4^x + 3x^4$$

$$(2) y = \cos x \cdot \log x$$

$$(3) y = (x - \cos x)^{-4}$$

$$(4) y = \left(\frac{2}{3}\right)^{-x} + \frac{2}{3}$$

$$(5) y = \frac{\cos x}{5 + \sin x}$$

Name:		الاسم:	
Group 2: J, K	Sec:	ID:	Serial:

Find y' , where

$$(1) y = 5^x \cdot \sin x$$

$$(2) y = 2x^3 - 3 \cos x$$

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

$$(4) y = \left(\frac{1}{3}\right)^{-x} + \sqrt{3}$$

$$(5) y = \frac{\log x}{x^3}$$

