Academic Year: 2012 – 2013 Semester: Spring Date: May, 2013 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

Question 1 — 6

Find **y`** where:

(a) $y = 3x^4 + 4x + 4$ (b) $y = \sin x \,.\, \ln x$ (c) $y = \frac{3}{5} - x \log x$

(d) $y = [3^x + \cos x]^8$ (e) $y = (\frac{2}{3})^x - \log x$ (f) $y = \frac{x}{\sin x}$

Question 2 — 10

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

(c) $\int x.e^x\, dx$ (d) $\int \frac{x}{x^2 - 3x + 2} dx$ (e) $\int_0^2 (3x^2 + 2)\, dx$

Question 3

(a)If $A = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 0 & 2 \\ 2 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & -2 & -3 \\ 2 & 0 & 1 \\ 1 & -1 & -2 \end{bmatrix}$. — 8

Find, if possible, A + B, |A|, B.C, $A + B^t$, A.C, |C|.

(b) Solve linear system: $\begin{bmatrix} 1 & -1 & 1 \\ 3 & 0 & 1 \\ 1 & -1 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 4 \\ 4 \end{bmatrix}$ — 4

Question 4

(a) Write the following linear system in matrix form and solve it: — 3

x – y + z = 1, 3x – 2y + 2z = 2, 4x – 3y + 4z = – 2.

(b) If a drug exists in 3 dosage forms : — 4

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 one possible solution.

Good luck *Dr. Mohamed Eid*

Academic Year: 2012 – 2013 Semester: Spring Date: April 2013 Duration Time: 1 Hour	Modern University For Technology & Information Faculty of Pharmacy	Mathematics: OCM 103 Mid-Term Exam Examiner: Dr. Mohamed Eid
Answer All Questions		Total Mark: 15

[1] Find y` where:

(a) $y = 3x^4 - 4\sin x$ (b) $y = 3 + 3^x . \ln x$ (c) $y = \cos x + (\log x)^8$ — 6

[2] Determine the maximum and minimum points of : $f(x) = 12x - x^3$ — 2

[3] Find the following integrals:

(a) $\int (x^3 - 4^x)\, dx$ (b) $\int (2\cos x - \sin x)\, dx$ — 4

(c) $\int (\frac{1}{x} + \sqrt{x+3})\, dx$ (d) $\int 2x(3 + x^2)^8\, dx$

[4] Find the integral: $\int \frac{x+1}{x^2-5x+6}\, dx$ — 3

Good luck *Dr. Mohamed Eid*

Name	ID

[1]If $A = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 0 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 0 & 2 \end{bmatrix}$. Find, if possible: $A + B$, $A.B$, $A.B^t$, $|A|$, $|A.B^t|$

[2]Write the equations: $x + 2y - z = 2$, $x + y + z = 3$, $-x - 2y + z = 0$
in matrix form and solve it.

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Answer

I-Name: Group: ID: .

[1]Determine the type of solution of the linear system: $\begin{bmatrix} 1 & 1 & -2 \\ 2 & 1 & 1 \\ 3 & 2 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ 4 \end{bmatrix}$

[2] If a medicine is available in 3 dosage forms :
First type of concentration: 1 mg /tablet
Second type of concentration: 3 mg /tablet
Third type of concentration: 4 mg /tablet
If the pharmacist wanted to prepare 10 tablets containing 2 mg / tablet by mixing whole tablets of each type. Find all possible solutions.

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Answer

II-Name: Group: ID: .

[1]Determine the type of solution of the linear system: $\begin{bmatrix} 1 & 1 & -2 \\ 2 & 1 & 1 \\ 3 & 2 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ 5 \end{bmatrix}$

[2] If a medicine is available in 3 dosage forms :
First type of concentration: 1 mg /tablet
Second type of concentration: 3 mg /tablet
Third type of concentration: 4 mg /tablet
If the pharmacist wanted to prepare 25 tablets containing 2 mg / tablet by mixing whole tablets of each type. Find all possible solutions.

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Answer

III-Name: Group: ID: .

[1]Determine the type of solution of the linear system: $\begin{bmatrix} 2 & 1 & -2 \\ 1 & 1 & 1 \\ 3 & 2 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 0 \end{bmatrix}$

[2] If a medicine 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 20 tablets containing 3 mg / tablet by mixing whole tablets of each type. Find all possible solutions.

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Answer

IV-Name: Group: ID: .

[1]Determine the type of solution of the linear system: $\begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & 1 \\ 3 & 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ 0 \end{bmatrix}$

[2] If a medicine exists in 3 dosage forms :
First type of concentration: 1 mg /tablet
Second type of concentration: 3 mg /tablet
Third type of concentration: 5 mg /tablet
If the pharmacist wanted to produce 20 tablets containing 2 mg / tablet by mixing whole tablets of each type. Find all possible solutions.

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Answer

V-Name: Group: ID: .

[1]Determine the type of solution of the linear system: $\begin{bmatrix} 2 & -1 & 1 \\ 1 & 3 & -1 \\ 3 & 2 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 2 \end{bmatrix}$

[2] If a medicine exists in 3 dosage forms :
First type of concentration: 2 mg /tablet
Second type of concentration: 4 mg /tablet
Third type of concentration: 5 mg /tablet
If the pharmacist wanted to produce 16 tablets containing 3 mg / tablet by mixing whole tablets of each type. Find all possible solutions.

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Answer