Academic Year: 2016 – 2017 Semester: Autumn Date: December 27, 2016	Modern University for Technology & Information مستقبل الصفوة **Faculty of Pharmacy**	Mathematics: OCM 103 Final Exam Duration Time: **2** Hours
Answer All Questions		No. of questions: 4 Total Mark: 60

Question 1

(a)If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 4 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 0 & 2 \\ 1 & 3 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 3 \\ 2 & 1 \end{bmatrix}$ 10

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

(b)Find the eigenvalues and eigenvectors of : $A = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$. 8

Question 2

(a)Solve the linear system : $x - y + z = 2$, $x + 2z = 3$, $2x - 2y + 2z = 5$. 5

(b)If a drug exists in three dosage forms : The first of concentration 1 mg / tablet , The second of concentration 2 mg / tablet , The third of concentration 4 mg /tablet. If the pharmacist wanted to produce 10 tablets of concentration 3 mg / tablet by mixing whole tablets. Find two possible solutions. 5

Question 3

(a)Find **y`** where: 12

(i) $y = 2x^4 + 4^x - 4x$ (ii) $y = 3 + x^3 . \ln x$ (iii) $y = \cos x . \log x$

(iv) $y = \frac{2}{3} + \frac{1}{[x+\sin x]^5}$ (v) $y = \sqrt{x} + \frac{3x}{4} + \frac{2}{x^5}$ (vi) $y = \frac{1}{x} + \cos^5 x$

(b)Find the integrals: 12

(i) $\int (x^4 + \frac{1}{x^4} + \frac{1}{x})dx$ (ii) $\int (\sqrt{x} + \frac{2^{x+1}}{3^x})\, dx$ (iii) $\int (\cos x - 2\sin x)\, dx$

(iv) $\int (3^x - 2^x)^2\, dx$ (v) $\int \ln x\, dx$ (vi) $\int \frac{x-1}{x^2-2x}\, dx$

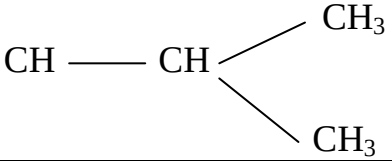
Question 4

(a)If the quantity of a drug in the blood decreases according to the data: 4

Time: t	0	2	4	6	8	Hours
Quantity: y	12	11	9	6	2	Units

From these data, find the relation y = a + bt. Also, find the value of y at t = 3.

(b)Write the matrix of the chemical compound : 4



Good Luck *Dr. Mohamed Eid*