



Basic Science Department Mathematics II Code: Math 102 Final Exam: January, 2014 Time Allowed: 2 hours	 Modern University For Technology & Information	Academic year: 2013 / 2014 Semester: Autumn Examiner: Dr. Mohamed Eid
Answer All questions	Faculty of Engineering	Total Mark 40
<p>ممنوع استخدام المحمول كآلة حاسبة. يُسمح فقط باستخدام الآلة الحاسبة العادية Do not use Mobile as Calculator. Only use regular Calculator</p>		
Question 1		
(a) If $A = \begin{bmatrix} 1 & 3 & 0 \\ 2 & 1 & -2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ 1 & 1 \\ 4 & 3 \end{bmatrix}$		6
Find, if possible, $A + B$, $A \cdot B^t$, $A + B^t$, BA , $ A \cdot B $		
(b) Find the eigenvalues and the eigenvectors of the matrix $A = \begin{bmatrix} 2 & 3 \\ 1 & 0 \end{bmatrix}$.		4
(c) Determine the type of solution of the linear system: $x + y + z = 5$, $x - y + 2z = 2$, $2x + 3z = 5$.		4
Question 2		
(a) Using the binomial theorem, expand $\frac{1}{3-2x}$		2
(b) Find S_n , S_{10} from the series: (i) $\sum_{r=1}^n \frac{1}{r^2+r}$ (ii) $\sum_{r=1}^n 2r(r^2 + 1)$		4
Question 3		
(a) State the definition hyperbola.		2
(b) Write the equation of circle where $(2, -3)$, $(1, 2)$ are ends of diameter.		2
(c) Find the angle between the lines and separate them $x^2 + xy - 2y^2 = 0$.		3
(d) Determine the vertex, focus and sketch the parabola $x^2 - 4x + 8y - 12 = 0$.		3
Question 4		
(a) Find center, vertices and sketch the ellipse: $x^2 + 4y^2 - 4x - 8y + 4 = 0$		4
(b) Determine the type of the curve: $2x^2 - 3xy + 2y^2 - 16 = 0$		4
(c) State the type of surface:		2
(i) $x^2 + y^2 + z^2 + 4x - 5 = 0$ (ii) $x^2 + (z - 2)^2 = (y - 3)^2$		

Good luck

Dr. Mohamed Eid

Basic Science Department Math. 2 Code: Math 102 Mid-Term Exam: November, 2013 Time Allowed: 60 Minutes	 Modern University For Technology & Information	Academic year: 2013 / 2014 Semester: Autumn Examiner: Dr. Mohamed Eid
Answer All questions	Faculty of Engineering	Total Mark: 30
<p>ممنوع استخدام المحمول كأداة حاسبة. يُسمح فقط باستخدام الآلة الحاسبة العادية Do not use Mobile as Calculator. Only use regular Calculator</p>		
<p>[1] If $A = \begin{bmatrix} 0 & 2 \\ 1 & 3 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 & -2 \\ 1 & 0 & 3 \end{bmatrix}$</p> <p>Find, if possible, $A + B$, $A + B^t$, A, $A.A^t$, and BA.</p>		8
<p>[2] Find the eigenvalues and the eigenvectors of the matrix $A = \begin{bmatrix} 2 & 4 \\ 1 & 2 \end{bmatrix}$.</p>		6
<p>[3] Write the following equations in matrix form and determine the type of solution : $x - y + z = 1$, $2x + y = 4$, $3x + z = 6$.</p>		4
<p>[4] Using the binomial theorem, expand: $\frac{1}{\sqrt[3]{8-2x}}$.</p>		4
<p>[5] Find S_n, S_{10} from the series:</p> <p>(a) $\sum_{r=1}^n \frac{1}{r^2+3r+2}$ (b) $\sum_{r=1}^n 3r(r+4)$</p>		8

Good luck

Dr. Mohamed Eid