Engineering Mathematics and Physics Department Mathematics 2 Code: Math 102 Time Allowed: **2 hours**	Modern University For Technology & Information **Faculty of Engineering**	Academic year: 2010/2011 Semester: Spring Final Exam: / 6 / 2011 Examiner: Dr. Mona Mehanna Dr. Mohamed Eid

Answer 5 questions only — **Marks**

Question 1

(a)Using mathematical induction to prove the validity of the following: 4

$$\frac{1}{2.3}+\frac{1}{3.4}+\frac{1}{4.5}+\cdots+\frac{1}{(n+1).(n+2)}=\frac{n}{2.(n+2)}.$$

(b) Use De Moiver's theorem to evaluate: $(2-3i)^{\frac{3}{4}}$. 4

Question 2

(a) Find the sum $\sum_{r=1}^{n}\frac{1}{(r+1)(r+3)}$ 4

(b) Solve the following linear system by inverse method: 4

$x-y+2z=6,\ 2x+y-z=5,\ x+y-z=2.$

Question 3

(a)Using the binomial theorem, expand $(5-3x)^{\frac{5}{3}}$. 4

(b)Find the eigenvalues and the eigenvectors of the matrix $A=\begin{bmatrix}2 & 4\\ 3 & 3\end{bmatrix}$. 2

(c)If $\alpha,\beta,\gamma,\delta$ are the roots of the equation: $x^4-15x^2-10x+24=0$, then find 4

(i) $\sum_{i} C_i^{\,2}$ (ii) $\sum_{i,j} C_i^{\,2}C_j$ 2

Question 4

(a)Complete the statement: The ellipse is locus of moving point such that…. 2

(b)Write the equation of parabola with focus F(0, 4) and direcrtix y = 0. 2

(c)Separate the lines $2x^2+3xy-2y^2-x+3y-1=0$. 4

Question 5

(a)Write the equation of circle where (3, – 2), (1, 2) are ends of its diameter. 2

(b)Write the equation of plane passing through the point (2, – 1, 1) and parallels to $2x-y+z=0$ 2

(c)Find center, vertices and sketch the ellipse $9x^2+4y^2-24y=0$. 4

Question 6

(a)Sketch the surfaces: (i) $x^2+y^2+z^2-2y=0$ (ii) $x^2+(y-1)^2-z^2=0$ 4

(b)Find center, vertices and sketch the hyperbola $x^2-y^2+4x+2y-1=0$ 4

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

Engineering Mathematics Department Course Code: Math 102 Analytical Geometry Time Allowed: 75 Minuets	Modern University For Technology & Information Faculty of Engineering	Academic year: 2010 / 2011 Semester: Spring Mid-Term Exam * Examiner: Dr. Mohamed Eid 20 – 4 – 2011

[1]Complete the statement: Ellipse is locus of moving point such that….

[2]Separate the lines $x^2 + xy - 6y^2 + 5y - 1 = 0$ and find the angle between them.

[3]Write the equation of circle where the points (1, – 1), (5, 1) are ends of diameter.
Also, determine its center.

[4]Find center, vertices and foci of the ellipse $4x^2 + 9y^2 - 24x = 0$ and sketch its curve

[5]Sketch the curve $y^2 - 4x - 2y - 3 = 0$

Good Luck

Quiz I: Date 30 – 3 – 2011 * Name: .

[1]Complete the statement: The circle is the locus of moving point such that….

[2]Separate the lines $x^2 - 3xy + 2y^2 + 2x - 4y = 0$

[3]Write the equation of circle where the points (2, – 1), (4, 1) are ends of diameter.

Answer

Quiz I: Date 30 – 3 – 2011 ** Name: .

[1]Complete the statement: The parabola is the locus of moving point such that….

[2]Separate the lines $2x^2 + xy - y^2 + 5x - y + 2 = 0$

[3]Determine the center and radius of circle: $x^2 + y^2 + 2x - 4y - 4 = 0$

Answer

Quiz II: * 18 – 5 – 2011 Time 35 Minutes

[1] Find center, vertices of the curve and sketch $2x^2 - y^2 + 4x + 2y - 5 = 0$

[2] Discuss the curve of equation: $2xy + 1 = 0$

[3]Write the equation of plane passing through the point (2, – 1, 1) and parallels to $2x - y + 3z = 0$

[4] Sketch the surfaces: (a) $x^2 + y^2 - 2x + 4y - 2z = 0$ (b) $x^2 + z^2 - y^2 + 2x + 1 = 0$

Good Luck

Quiz II: ** 18 – 5 – 2011 Time 35 Minutes

[1] Find center, vertices of the curve and sketch $2x^2 - y^2 + 4x + 2y + 11 = 0$

[2] Discuss the curve of equation: $3xy + 2 = 0$

[3]Write the equation of plane passing through the point (0, – 1, 1) and parallels to $2x - y + 3z - 4 = 0$

[4] Sketch the surfaces: (a) $x^2 + z^2 + 2x - 2y + 4z = 0$ (b) $x^2 - y^2 - z^2 - 2x - 1 = 0$

Good Luck