

UNIVERSITY *of* LIMERICK
OLLSCOIL LUIMNIGH

Faculty of Science and Engineering

MID-SEMESTER ASSESSMENT PAPER

MODULE CODE: MA4402

SEMESTER: Autumn 2012

MODULE TITLE: Computer Mathematics 2

DURATION OF EXAMINATION: 45 minutes

LECTURER: Dr. N. Kopteva

PERCENTAGE OF TOTAL MARKS: 20%

INSTRUCTIONS TO CANDIDATES: Answer ALL QUESTIONS.

To obtain maximum marks you must show all your work clearly and in detail.

Write all your answers and rough work on the examination paper. Do not write on anything else.

Under no circumstances should you use your own tables or be in possession of any writing material other than this exam paper.

The examination rules of the University apply to this midterm. Any breaches of these rules (and in particular any attempt at cheating) will result in disciplinary proceedings. For a first offence this can result in a year's suspension from the University.

Your Name: (PLEASE PRINT) _____

Your UL ID: _____

ROUGH WORK

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**Please, do NOT open this paper
until ANNOUNCED by your lecturer**

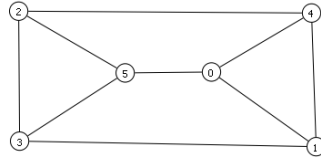
EVERYBODY IS SUPPOSED TO START AT THE SAME TIME

1 Draw the bipartite complete graph $K_{2,4}$.

2%

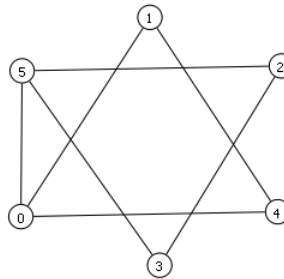
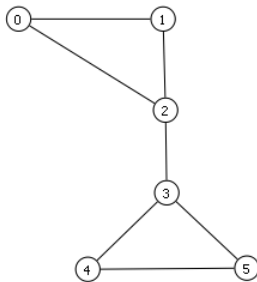
2 Find an Eulerian Circuit or an Eulerian path in the graph below or prove that neither exist. Is it an Eulerian graph? Is it a traversable graph?

3%



3 Show that the two graphs below are isomorphic:

5%



4 Evaluate the determinant of the given matrix:

$$\begin{vmatrix} 5 & -1 & 7 & 13 \\ 9 & 2 & 6 & -4 \\ 3 & 0 & 1 & 5 \\ 0 & 0 & 0 & 2 \end{vmatrix}$$

3%

5 Find the angle $\angle BAC$, where $A = (2, 2)$, $B = (4, 1)$ and $C = (4, 6)$.

4%

6 Rotate the point $(2, 4)$ by the angle $\frac{\pi}{3} = 60^\circ$ in the anti-clockwise direction about the origin.

3%

USEFUL FORMULAE:

Angle	0	$\frac{\pi}{6} = 30^\circ$	$\frac{\pi}{4} = 45^\circ$	$\frac{\pi}{3} = 60^\circ$	$\frac{\pi}{2} = 90^\circ$
sin	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0

Question 1.

.....
Question 2.

Question 3.

Question 4.

.....
Question 5.

Question 6.