



TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF MATHEMATICS

EXAMINATION FOR SENIORS (LEVEL FOUR) STUDENTS OF COMPUTER SCIENCE

COURSE TITLE: SELECTED TOPICS IN COMPUTER COURSE CODE: CS4109

DATE: 23-12-2017 TERM: FIRST TOTAL ASSESSMENT MARKS: 150 TIME ALLOWED: 2 HOURS

Answer only three Questions: الاختبار من ورقتين

QUESTION 1: [Total marks: 50]

Consider the following training data:

Book	Author	Quality	Scope	Decision
1	Mosaad	High	Learning	Reads
2	Mosaad	Low	Network	Skips
3	Mosaad	High	Network	Reads
4	Atlam	Low	Network	Reads
5	Atlam	High	Learning	Skips
6	Atlam	High	Cloud	Skips
7	Omar	High	Network	Skips
8	Omar	Low	Learning	Skips
9	Atlam	High	Network	Reads
10	Mosaad	High	Network	Reads

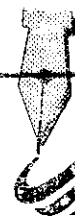
- Use General-to-specific algorithm to learn the concept: "which books are preferred for reading?" (15 marks)
- Use ID3 algorithm to create the decision tree that represents these training data. (20 marks)
- Induce the set of rules that match the positive examples only (examples with the decision: reads) from the decision tree (of part b). (7 marks)
- Translate the induced rules (of part c) into the hypothesis that match the training data. (4 marks)
- Use the concluded hypothesis (of part d) to classify the following new examples: (4 marks)

11	Mosaad	High	Cloud	
12	Omar	High	Learning	


QUESTION 2: [Total marks: 50]

Consider you use ACO metaheuristic to solve the traveling salesman problem given that:

- There are 5 cities: A, B, C, D, and E.
 - The tour begin at home city (determined randomly) and each city must be visited just once before finally returning to the starting home city
 - The distances between these cities are: $d_{AB} = 100$, $d_{AC} = 60$, $d_{AD} = 50$, $d_{AE} = 70$, $d_{BC} = 60$, $d_{BD} = 70$, $d_{BE} = 60$, $d_{CD} = 90$, $d_{CE} = 40$, $d_{DE} = 150$.
 - $\tau_0 = 0.2$, $\alpha = 1$, $\beta = 2$, and $\rho = 0.5$.
- Draw the construction graph that illustrates the configuration of the problem. (10 marks)
 - Use single Ant and assign it randomly to home city. Trace this ant to show how it finds next sub-solution at each iteration (in one cycle). (30 marks)
 - Update the pheromone on the found path of the Ant tour. (10 marks)



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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS		
	EXAMINATION FOR SENIORS (LEVEL FOUR) STUDENTS OF COMPUTER SCIENCE		
	COURSE TITLE: COMPUTER GRAPHICS	COURSE CODE: CS4105	
DATE: 30-12-2017	TERM: FIRST	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

Answer only three Questions:

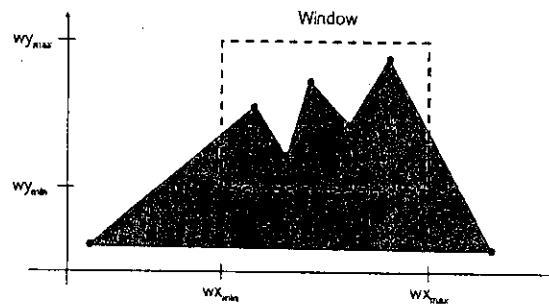
الاختبار من ورقتين

QUESTION 1: [Total marks: 50]

1. Consider the line segment with the two endpoints (3, 3) and (12, 9):
 - a. Write digital differential analyzer (DDA) drawing algorithm. (5 marks)
 - b. Write Bresenham's line generation algorithm. (5 marks)
 - c. Use DDA to draw the line. (20 marks)
 - d. Use Bresenham algorithm to draw the line. (20 marks)

QUESTION 2: [Total marks: 50]

1. Assume the clipping window have the following coordinates: $(x_{min}, y_{min}) = (150, 150)$ and $(x_{max}, y_{max}) = (350, 250)$. Use Cohen-Sutherland algorithm to clip the line AB with endpoints (180,120) and (410,260). (20 marks)
2. State Blinn-Phong shading model. Explain in brief its terms. Why do we use the power P and max operation in this model? (10 marks)
3. Consider the following polygon to be viewed in the window: (20 marks)



Use Sutherland-Hodgeman algorithm to clip the polygon.

QUESTION 3: [Total marks: 50]

1. Discuss the three possible cases when we shoot a ray toward a sphere. (10 marks)
2. What are the parts of ray tracing algorithm? What are the applications that the ray tracing is suited for and those that the ray tracing is not suited for? (9 marks)
3. A ray tracer is used to render a scene consisting of 350 objects and computed with a spatial resolution of 512 x 480, assuming 10 floating-point operations (fpos) per object test. How many fpos are needed for computing intersections? (5 marks)
4. What are the basic principles of light? (10 marks)
5. Define the sampling process and its simplest version. (6 marks)
6. Compare between each of the following: (10 marks)
 - a. Ray tracing algorithm and rasterization.
 - b. Defuse reflection and specular reflection.

انظر خلفه

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DEPARTMENT OF MATHEMATICS
TANTA UNIVERSITY
FACULTY OF SCIENCE
(Computer Science Division)



EXAMINATION FOR PROSPECTIVE STUDENTS (4TH YEAR)

COURSE TITLE: برامج متقدمة في لغة الجافا

COURSE CODE: CS4107

DATE: 03-01-2018

JAN 2018

TERM: 1

TOTAL ASSESSMENT MARKS: 100

TIME ALLOWED: 2 HOURS

Question 1:(30 marks)

- The compareTo method is defined in Comparable, implement this method in the class comparableRectangle
- Write a program to show the benefits of defining the abstract methods?
- List the using of inner classes?
- List the attributes for a given font which can be measured by FontMetrics class?
- What is the difference between the setSize(width, height) method and the pack() method in JFrame?
- Define a toggle button, a horizontal alignment, and a label?

Question 2:(30 marks)

- What is the wrong in the following code?

```
class NewPanel implements JPanel {
    void paintComponent (Graphics g) {
        super. paintComponent (g);

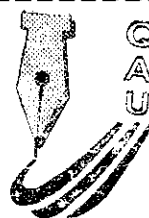
        g.drawLine("line",30,20)
        g.drawString(string,20,10); }}
```

- Write the two things which are needed for an object to be a listener for an event on a source object?
- Give an example of creating a text field with red foreground color and left horizontal alignment?
- Write statements to create a list with six items, red foreground, white background, pink selection foreground, black selection background, and visible row count 2?

Question 3:(20 marks)


- List features of an inner class?
- What are the two listener interfaces for the mouse events?
- Write statements to create a combo box with six items, red foreground, white background, and the third item selected?
- Write statements to create horizontal and vertical scroll bars?

انظر الخلف



وحدة ضمان الجودة
كلية العلوم - جامعة طنطا
QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU



 1969	Tanta University		
	Faculty of Science		
	Department of Mathematics		
	Final term exam for the first semester 2017-2018		
Course title:	Operarions Research (2)	Course code: MA4105	
Date: 6 /1 /2018	Total Marks: 150	Time allowed: Hours	

Answer all the following questions:

First question: (40 Marks)

(a) Discuss the convexity of the following sets:

(i) $S = \{x : x = (x_1, x_2) : x_1 \geq 2, x_2 \leq 4\}$.

(ii) $S = \{x : g_i(x) \leq 0, i = 1, 2, \dots, m\}$, where $g_i(x)$ are convex functions .

(b) Find whether the $f(x) = 25x_1^2 + 34x_2^2 + 41x_3^2 - 24x_2x_3$ is a positive definite or not.

(c) Prove that if $f(x)$ and $g(x)$ be convex functions defined over a convex set S then the sum $f(x) + g(x)$ is a convex function?.

Second question: (40 Marks)

(a) Find the local extrema $f(x_1, x_2, x_3) = x_1^2 + (x_1 + x_2)^2 + (x_1 + x_3)^2$.

(b) Using Lagrangian multipliers to find the extreme points for the function

$$z = f(x_1, x_2) = 4x_1 + 6x_2 - 2x_1^2 - 2x_1x_2 - 2x_2^2$$

Subject to the constraint: $x_1 + 2x_2 = 2, x_1, x_2 \geq 0$

Determine whether the etreme points are maximum or minimum.

Third question: (30 Marks) ok

(a) Minimize $f(x) = x_1^2 + x_2^2 + 2x_1 + 4x_2 + 5$ using the steepest descent method starting at the point $x_1 = 0$ and $x_2 = 0$.

(b) By direct substitution method solve the following NLPP

$$\min f(x) = x_1^2 + (x_2 + 1)^2 + (x_3 - 1)^2 \text{ subject to constraint } x_1 + 5x_2 - 3x_3 = 6.$$

Fourth question: (40 Marks)

(a) Show that the following function is convex

$$f(x_1, x_2, x_3) = 3x_1^2 + 2x_2^2 + x_3^2 - 2x_1x_2 - 2x_1x_3 + 2x_2x_3 - 6x_1 - 4x_2 - 2x_3$$

(b) Use the Kuhn-Tucker conditions to solve the NLPP:

$$\text{maximize } z = 10x_1 + 4x_2 - 2x_1^2 - x_2^2 \text{ subject to } 2x_1 + x_2 \leq 5, x_1, x_2 \geq 0.$$

(Best wishes)

Examiners:	1- Prof. Dr. E.A. Youness	2- Dr. N. A. El-Kholy
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