



## قسم الرياضيات

الامتحان  
الاساسي  
الاساسي

UNIVERSITY  
OF SCIENCE  
OF MATHEMATICS

The Second Semester 2015-2016

Systems

Course Code: 3204

150 Marks

Time Allowed: 2 Hours

الاختبار من ورقتين

arrive for execution at the times indicated.  
of time listed. (40 marks)

time	Burst time
	12
2	8
4	7
5	3
7	4

- the average waiting time for these processes with:
- FCFS;
  - Non-preemptive SJF;
  - Preemptive SJF;
  - RR with  $q = 4$ .

- Explain how the operating system makes sure that each process has a separate memory space. (10 marks)

**QUESTION 2: [Total marks: 50]**

- Compare between each of the following pairs according to the items listed. (20 marks)

Items	Contiguous memory allocation	Paging
Idea		
Memory utilization		
Fragmentation		

Items	FCFS	SJF	RR
Idea			
Starvation			
Preemption			
Convoy effect			

- Consider the memory in the figure below. Assume that page size = 4 bytes and physical memory of 32 bytes, then compute the physical addresses for the following logical ones: (30 marks)

0	a
1	b
2	c
3	d
4	e
5	f
6	g
7	h
8	i
9	j
10	k
11	l
12	m
13	n
14	o
15	p

0	1
1	2
2	5
3	6

page table

logical memory

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TANTA UNIVERSITY  
FACULTY OF SCIENCE  
DEPARTMENT OF MATHEMATICS

EXAMINATION FOR PROSPECTIVE STUDENTS (3<sup>RD</sup> YEAR) STUDENTS OF  
MATHEMATICS

COURSE TITLE: TOPOLOGY(1)

COURSE CODE: MA 3204

DATE: 31/5/2016

TERM:2

TOTAL ASSESSMENT MARKS:150

TIME ALLOWED: 2 H

**Answer the following questions:**

**First question: (50 marks)**

- 1- Prove that  $\tau = \{\emptyset, N, E_n = \{n, n+1, n+2, \dots\} : n \in \mathbb{N}\}$  is a topology on  $\mathbb{N}$ ?  
find the closed sets? If  $A = \{1, 10\}$  find  $A^c, \bar{A}, A^\circ, b(A), Ext(A)$ ? (29 marks)
- 2- Prove that in a space  $X$   $a - A$  is closed iff  $A = \bar{A}$ , (7 marks)  
 $b - \{A^\circ, A^b, A^{ext}\}$  is a partition on  $X$ ? (7 marks)  
 $c - \bar{A} = A \cup A'$ ? (7 marks)

**Scand question: (50 marks)**

- 1- Let  $\beta$  be a class of subsets of a non empty set  $X$ . Prove that  $\beta$  is a base for some topology on  $X$  iff it has the following two properties  
a-  $X = \cup\{B : B \in \beta\}$   
b- For any  $B, B^* \in \beta$ , then  $B \cap B^*$  is a union of member of  $\beta$ ? (20 marks)
- 2- Show that if  $(X, \tau)$  is a topological space and  $Y \subseteq X$ , then  $A \subseteq Y$  is  $\tau_y$  closed iff  $A = Y \cap F$ , where  $F$  is closed in  $X$ ? (15 marks)
- 3- Let  $f$  be a function from a space  $X$  into a space  $Y$ , then  $f$  is an open function if  $f(A^\circ) \subseteq (f(A))^\circ$  for every  $A \subseteq X$ ? (15 marks)

**Thread question: (50 marks)**

- 1- Let  $f$  be a function from a space  $X$  into a space  $Y$ , then the following statement are equivalent  
a-  $f$  is a continuous function?  
b-  $f(\bar{A}) \subseteq \overline{f(A)}$  for every  $A \subseteq X$ ?  
c-  $\overline{f^{-1}(B)} \subseteq f^{-1}(\bar{B})$  for every  $B \subseteq Y$ ? (20 marks)
- 2- Define and give an example for  
a- A subbase for the topology (5 marks) b- A neighbourhood system (5 marks)  
c- A relative topology (5 marks) d- A homeomorphism (5 marks)
- 3- Show that if  $N_p$  is the neighborhood system of a point  $p$  in a space  $X$ , then the intersection of any two members of  $N_p$  belongs to  $N_p$ ? (10 marks)

EXAMINERS	PROF. DR/ ABD EL-MONEAM M. KOZAE
	DR/ MOHAMMED. M. EL-SHARKASY

*With my best wishes*

