National University of Computer and Emerging Sciences, Lahore Campus

	Course:	Operating System	Course Code:	CS-205
	Program:	BS(Computer Science)	Semester:	Fall 2017
	Duration:	1 hour	Total Marks:	50
	Paper Date:	18^{th} September, 2017	Weight:	15%
	Section:	All	Page(s):	3
	Exam:	Mid-1	Roll No.	

Instructions/Notes: Answer questions on the question paper. Write answers clearly and precisely, if the answers are not easily readable then it will result in deduction of marks. Use extra sheet for rough work, cutting and blotting on this sheet will result in deduction of marks.

Question 1 (2 points): List the missing components of a common computer system, used by a human being.

(1) User

(2)

(3) Operating System

(4)

Question 2 (3 points): List three main resources which an Operating System has to manage.

(a)

(b)

(c)

Question 3 (2 points): Which of the following scheduling algorithms is non-preemptive?

(a) Round Robin

(b) FCFS

(c) Shortest Remaining Time First

(d) Multi Level Feedback Queue

Question 4 (6 points): When you write a piece of code and compile it, you get an output that can be used to accomplish something on a computer system. That output is called a _____(a)_____ and it is stored on _____(b)_____. If we turn of the computer the output will be erased or not? _____(c)_____

(a)

(b)

(c) YES / NO (Circle the right option)

Question 5 (5 points): List down any five elements of a **process control block**.

(1)

(2)

(3)

(4)

(5)

Question 6 (7 points): **Circle** the elements of a process which are shared by threads. **Leave** the elements whose individual copy for each thread is created separately.

(a) Stack Segment

(b) Heap Segment

(c) Code Segment

(d) Data Segment

(e) Open File Pointers

(f) Register Values

(g) Program Counter

Question 7 (5 points): The designer wants an operating system which runs jobs in the order of their arrival. The operating system maintains a queue for this. The operating system does not give CPU to any other job until and unless the running job is completed (terminated).

- Name the **scheduling algorithm** the designer will use in such an operating system
- Can designer use Round Robin Algorithm? give one **reason**

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Question 8 (5 points): We have studied the life cycle of a process in a common operating system that is described in the form of a state diagram. Draw a **state diagram** for the life cycle of a process, for the scenario mentioned above. Is this state diagram same as we studied in the lectures, or not?

Question 9 (5 points): Suppose you are writing code for an embedded system. Your system will regulate the temperature of a shower. It has one sensor to read the current temperature and an actuator that controls the proportion of hot and cold water. The chip for the controller has the capability of switching between user mode and kernel mode. To implement your solution, is it necessary to use both **user mode and kernel mode**? Give one reason.

Question 10 (5 points): If I use FCFS algorithm in an operating system for personal computers, **what will user experience** if he runs a music player to listen to music while the computer recognizes text from a large amount of big images (a big OCR job). **Will the jobs complete**? yes or no.

Question 11 (5 points): A printer has to print jobs with different priorities. What will be the best **scheduling strategy** that ensures (Hint: use more than one ingredients to build the recipe.)

- All jobs get printed at the end, there is no starvation
- High priority jobs get printed first
- A job is not preempted during its printing, otherwise the output will be garbage.