Xi'an Jiaotong-Liverpool University

西交利物浦大学

PAPER CODE	EXAMINER	DEPARTMENT	TEL
CSE108		Computer Science and Software Engineering	

2nd SEMESTER 2016/17 REGULAR EXAMINATIONS

BACHELOR DEGREE – Year 2

Operating Systems Concepts

TIME ALLOWED: 2 Hours

INSTRUCTIONS TO CANDIDATES

1、   Total marks available are 100.

2、   Answer all questions.

3、   The number in the parentheses at the end of each question indicates the marks for each question.

4、   Answer should be written in the answer booklet(s) provided.

5、   The university approved calculator - Casio FS82ES/83ES can be used.

6、   All the answers must be in English.

1. Explain the following terms:

1.1 Process Control Block. (10 marks)

1.2 RAID. (10 marks)

2. Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Arrival Time
P1	4	0
P2	2	1
P3	9	2

2.1 Draw Gantt charts that illustrate the execution of these processes using First Come First Served Scheduling. Compute the average waiting time. (10 marks)

2.2 Draw Gantt charts that illustrate the execution of these processes using Shortest Remaining Time First Scheduling. Compute the average waiting time. (10 marks)

3. Consider the following page reference string: 2, 3, 2, 7, 5, 2, 6. Assuming demand paging with three frames, how many page faults would occur for the following replacement algorithms? Justify your answer by giving a trace of how the page resident in each frame changes over time.

3.1 First In First Out replacement. (10 marks)

3.2 Optimal Page replacement. (10 marks)

4. Suppose we have a large variety of resources that have value for a large number of users. For example, in a medical information system, we keep sensitive information about a large number of patients. Unrestricted disclosure of this data would violate the privacy of the patients, while unrestricted modification could jeopardize their health. However, the number of individual rights is just too large; granting rights to individual users would require storing many authorization rules, and it would be hard for administrator to keep track of these rules. It is also hard to associate semantic meanings to the rules.

How can we reduce the number of rules and make their semantics clearer? Design a system that can fulfill the requirement; **specify its system structure (20 marks), security policy principle (10 marks), and access control model (10 marks)**.

END OF EXAM PAPER