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 RESIT 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 File control block. (10 marks)

1.2 Virtual memory. (10 marks)

2. Assume in a system, there are:

- 3 processes P1 to P3;
- 3 resource types: A (9 instances), B (4 instances), and C (4 instances).

Below is a snapshot at time T:

	Allocation			Max		
	A	B	C	A	B	C
P1	0	1	0	6	4	2
P2	3	3	1	3	3	2
P3	3	0	2	9	0	2

2.1 Show that the system is in a safe state at time T. (10 marks)

2.2 Can request for (A: 2, B: 0, C: 1) by P1 be granted? Explain your answer. (10 marks)

3. Consider a disk queue holding requests to the following cylinders in the listed order: 91, 151, 21, 11, 61, 68. Assume the disk head is at cylinder 56 and moving downward through the cylinders

3.1 Using the FCFS scheduling algorithm, what is the order that the requests are serviced? (10 marks)

3.2 Using the SSTF scheduling algorithm, what is the order that the requests are serviced? (10 marks)

4. Suppose we have resources that have value for users or institutions. For example, in a medical information system, we keep sensitive information about patients. Unrestricted disclosure of this data would violate the privacy of the patients, while unrestricted modification could jeopardize their health. We need a way to control access to resources, otherwise any active entity could access any resource and we could have confidentiality and integrity problems.

Design a system that can control who is authorized to access specific resources; **specify its system structure (20 marks), security policy principle (10 marks), and access control model (10 marks)**.

END OF EXAM PAPER