EASTERN UNIVERSITY, SRILANKA

SECOND EXAMINATION IN SCIENCE-2005/2006

FIRST SEMESTER (Aug/Sep, 2007)

Operating System - CS 202

(Proper & Repeat)

Answer all Questions **Time Allowed: 2 Hours**

Q1)

a) What do you mean by the term "**Batch System**"? (15)

b) Clearly describe the "**Multiprogramming Concept**". (15)

c) What is the function of the "**Process Control Block**"? (10)

d) Briefly explain the "**Round Robin Scheduling**". (15)

e) There are six jobs which are allocated to a computer. Jobs details are given below: (45)

Job No	*Arrival Time(ms)*	*Processing Time(ms)*	*Priority*
J – A	0	5	1
J – B	2	15	5
J – C	3	12	2
J – D	5	10	4
J – E	8	7	3
J – F	9	9	2

Note:

- Quantum time = 3 ms.
- Lowest priority value is 5.

You are requested to draw the execution pattern and find the "Average Turn Around Time" and the "Average Waiting Time" for the above process in the non – preemptive manner using the following scheduling algorithms:

i) Round Robin;

ii) Priority Scheduling;

iii) Shortest – Job – First.

Q2)

a) Briefly describe the term "**Virtual Memory**".

b) What do you mean by "**Demand Paging System**"?

c) Briefly explain the "**Memory Allocation Policies**".

d) Clearly explain the mechanism to allocate the jobs in the "**Fixed Memory Partitio** environment.

e) The following tables focus the job details and the memory lists.

Job No	*Job Size(Bytes)*
J – 1	10240
J – 2	15360
J – 3	25600
J – 4	30720
J – 5	51200
J – 6	5120

Memory Location	*Memory Block Size*
1024	08
1055	12
1085	16
1095	31
1125	50
1175	27
1235	06

i) You are requested to allocate the jobs in the memory and to find the internal fragmentation using the following allocation methods:

- Best – Fit Memory Allocation;
- First – Fit Memory Allocation.

ii) You are adviced to utilize the memory block size and perform the above tas a successful manner. Which type of memory allocation would you sugg Justify your answer.

Q3)

a) What do you mean by "**Dead Lock**"? (

b) Briefly describe the "**Necessary Conditions**" for a dead lock to occur. (2

c) How can you prevent the system from a dead lock? (1

d) Clearly explain the "**Dead Lock Detection Algorithm**". (1

e) Consider the following system: (4

The system has four processes P1, P2, P3, and P4; and 2 units of resources R1 and R2, and 1 unit of resources R3 and R4.

Note: | 0 R 0 | - It indicates 2 units of the same resource are available.

- Process P1 holds R1 and wants R2.
- Process P2 holds R1 and wants R2.
- Process P3 holds R4 and wants R2 and R3.
- Process P4 holds R3 and wants R4.

i) Clearly draw the resource graph for the above system.

ii) State whether the above system is in dead lock or not? Justify your answer.

iii) If it is in dead lock, then how can you detect it?

Q4)

a) Briefly describe the term "**Access Method**" in file management environment. (20)

b) What do you mean by "**File Operation**" in a file management environment? (20)

c) Briefly explain the following topics: (15x4 = 60)

- SCAN Scheduling;
- SSTF (Shortest – Seek – Time – First) Scheduling;
- File Attributes;
- I/O Devices.