

**Sylhet Engineering College, Sylhet**  
Department of Computer Science and Engineering (CSE)  
3<sup>rd</sup> year 1<sup>st</sup> Semester Term Test, 2019

Course No.: CSE-507

Course Title: Operating System

- |  |    |
|--|----|
| Q1. Write the goals and functions of Operating System.       | 04 |
| Q2. Differentiate between Multiprogramming and Multitasking. | 03 |
| Q3. Define Spooling with example.                            | 03 |

**Sylhet Engineering College, Sylhet**  
Department of Computer Science and Engineering  
2<sup>nd</sup> year 2<sup>nd</sup> Semester Term Test, 2019

Course No.: CSE-507

Course Title: Operating System

Q1. Describe Process States.

05

~~Q2.~~ Consider five processes, arrival time and their burst time. Calculate Avg. waiting time, Avg. turnaround time and Avg. response time. *using HRRN algorithm.*

05

Process	Arrival time	Burst tme
P1	1	5
P2	2	2
P3	4	3
P4	6	6
P5	8	4

**Symmet Engineering College, Symmet**  
**3<sup>rd</sup> year 1<sup>st</sup> Semester Final Examination – 2017**  
**Department of Computer Science & Engineering**  
**Course No: CSE 507**  
**Course Title: Operating System**

Time: 3.00 Hours

Total Marks: 70

[Answer any four questions, taking two from each part]

**PART - A**

- 1.a) Why is it not possible to store all our data and programs in main memory? What is the solution to this problem? 2
- b) What are the benefits of systems with two or more processors? 3
- c) What are the effects of time quantum on turnaround time? How can they be minimized? 3
- d) Describe the scenarios when a parent process can terminate a child process. 2.5
- e) Describe a socket with example. Draw the UNIX operation System architecture. 3+4
- 2.a) What are the advantages of Parallel System? 3
- b) Draw the Diagram of Process Creation. 2.5
- c) Observe the following Table. 12

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

Now, answer the following Questions:

- i) Draw the Gantt Chart for the Scheduling Algorithm FCFS, SJF, Priority and RR (Time Quantum = 4).
- ii) Calculate the Turnaround Time of each process of each of the mentioned algorithms.
- iii) Calculate the Waiting Time of each process of each of the mentioned algorithms.
- 3.a) What services does the operating system provide? Describe in detail. 4
- b) What are the roles of long term scheduler and short term scheduler? Draw the process state diagram. 2+3
- c) Explain virtual machines with figure. What are the benefits of using them? 2+4
- d) How does a shared memory system work? Describe with figure. 2.5

**PART - B**

- 4.a) Describe multithreading models. 2.5
- b) Consider the following snapshot of a system: 4+3

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P1	0	0	1	2	3	4	1	2	3	4	1	3
P2	2	1	0	0	5	7	6	3				
P3	3	3	3	1	3	3	5	6				
P4	0	1	4	2	7	6	5	2				
P5	0	0	1	2	0	6	7	6				

- i) Determine whether the system is in safe state or not. If yes, write down the safe sequence. ✓

- ii) If a request from process P3 arrives for (0, 0, 1, 2), can it be granted immediately.

- c) Explain demand paging. 2
- d) What is a deadlock? What are the necessary conditions for a deadlock? 1+2
- e) How can a request of size n be satisfied from a list of free holes? 3

- 5.a) Compare between paging and segmentation. 3
- b) Describe the following: i) address binding ii) Dynamic linking 4
- c) Write down Peterson's solution and show that it satisfies all three requirements for the critical section problem 3+2.5
- d) What is a semaphore? What are the disadvantages of using semaphores and what construct is used to counter them? 2+3
- 6.a) What is a thread pool? What are its advantages? 1+2
- b) Explain the problems associated with storing page tables using registers and memory. Describe the hardware used to solve these problems. 2+4
- c) Explain the copy-on-write method. 2.5
- d) What are the issues associated with deadlock recovery? 2
- e) Given below is the references made to the following pages by a program: 4
- 0, 2, 4, 1, 5, 1, 4, 3, 0, 3, 1, 0, 2, 5, 6, 7, 1, 2, 0, 2
- Show the successive pages residing in three frames.
- i) LRU replacement
- ii) Optimal replacement.

--- :: ---

**Sylhet Engineering College, Sylhet**  
(Shahjalal University of Science & Technology)  
Department of Computer Science & Engineering

Final Examination, 2018  
Course No: CSE507  
Time: 03 (Three) hours

3<sup>rd</sup> year 1<sup>st</sup> Semester  
Course Title: Operating System  
Full Marks: 70

N.B. : (i) Answer any two question from each PART  
(iii) Marks allotted are indicated in the margin

(ii) Use separate answer scripts for each PART  
(iv) Special Instruction (if any)-----N/A-----

**PART-A**

(Answer any two questions)

1. (a) What is an operating System? Explain different types of operating system. 06
- (b) What are the difference between Multiprogramming and Time-sharing structure? 04
- (c) What is Batch processing? Compare the performance of batch processing system with others. 05
- (d) What is virtual memory? How we can implement virtual memory concept? 2.5
2. (a) What is the difference between a Job and a Process? 2.5
- (b) Draw and explain process state diagram. 05
- (c) Define PCB? What are the attributes of PCB? 05
- (d) Describe Spooling process with diagram 05
3. (a) What is CPU Scheduling? Explain different types of schedulers. 05
- (b) What is Preemptive and Non Preemptive Process? 02
- (c) What are the CPU scheduling algorithm criteria? 05
- (d) Define context switching. 2.5
- (e) Define Turnaround Time, Waiting Time and Response Time. 03

**PART-B**

(Answer any two questions)

4. (a) Mention the primary differences between short-term, mid-term and Long-term scheduler. 05
- (b) Define CPU-bound process and I/O-bound process. 2.5
- (c) Consider the following situation: 07

Process	Arrival Time	Burst Time	Priority
P <sub>1</sub>	1	4	1
P <sub>2</sub>	0	3	2
P <sub>3</sub>	2	1	3
P <sub>4</sub>	4	2	4
P <sub>5</sub>	6	6	5

Now draw Gantt chart for Round Robin (time quantum: 2) and Preemptive Priority Scheduling. Find average waiting time, average response time and average turnaround time.

- (d) What are the different types of scheduling queues? 03
5. (a) What do you mean by Deadlocks? What are the necessary conditions for deadlocks? 04
- (b) What are the methods for Handling Deadlocks states? 02
- (c) Define compaction. Write down the differences between paging and segmentation 4.5
- (d) Consider the following snapshot of a system and answer the following questions using Banker's Algorithm. 07

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P <sub>1</sub>	1	0	0	7	5	0	4	2	0
P <sub>2</sub>	3	5	4	3	5	6	0	0	2
P <sub>3</sub>	6	3	2	6	5	2			
P <sub>4</sub>	0	1	4	6	5	6			
P <sub>5</sub>	0	1	2	0	1	2			

Is the system in a safe state? If yes then write the safe sequence.

*Work = Work + allocation*

- |        |   |     |
|--------|---|-----|
| 6. (a) | What are the differences between logical and physical addresses?  | 03  |
| (b)    | Given memory partitions of 100 KB, 500 KB, 200 KB, 300KB and 600KB, how each storage allocation algorithms place processes of 212KB, 417KB, 112KB, and 426KB? Explain which algorithm makes the most efficient use of memory? | 5.5 |
| (c)    | What do you mean by the term swapping?  | 03  |
| (d)    | What is fragmentation? Explain different types of fragmentation.  | 06  |