B3.4-R4: OPERATING SYSTEM

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.

a) Differentiate between pre-emptive and Non-pre-emptive scheduling Technique.
b) Differentiate between internal fragmentation and external fragmentation.
c) What is round robin scheduling? Explain using an example. Can it be useful for a single user system? Justify your answer.
d) What is the critical section problem? How is it handled?
e) What is a distributed operating system? Write down its two main functionalities over a stand-alone operating system.
f) Explain the concept of Virtual Private Network (VPN) and Intranet.
g) Explain Graphics and Multimedia services in detail.

(7x4)

2. Consider the following snapshot of a system:

Processes	**Allocation**	**Max**	**Available**
	A B CD	A B CD	A B CD
P0	0 0 1 2	0 0 1 2	1 5 2 0
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:

a) What is the content of the matrix Need?
b) Is the system in a safe state? Justify, clearly showing the steps of the algorithm.
c) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately?

(18)

3. Why disk scheduling is important? Explain three Disk Scheduling techniques in detail and using examples.

(18)

4.

a) Give four different views of Operating System.
b) What would be the effect of the system running too many I/O Jobs?
c) In the context of process management, differentiate between Long-Term Scheduling, Short Term Scheduling and Medium Term Scheduling.

(6+6+6)

5.

a) Consider the following page reference string:

5, 7, 2, 1, 3, 4, 7, 2, 1, 3, 2, 1, 4, 5, 7

How many page faults would occur for least-recently-used and FIFO page replacement algorithms, assuming 3 frames? Initially pages 7, 5 and 1 are loaded in the main memory.
b) What features of Network operating system make it suitable for use in network devices?

(12+6)

6.

a) Discuss the various attributes of a file? What are the methods that help in accessing the information stored in a file? Discuss them briefly?

b) Differentiate between buffering and spooling.

c) Differentiate between worms, virus and Trojan horse.

(9+4+5)

7. Write short note on the following topics -

a) Windows Server

b) User Account Controls (UAC)

c) File system formats

(3x6)