# **Question Paper**

Exam Date & Time: 01-Jul-2022 (02:00 PM - 05:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal Second Semester M.Sc.Information Science Degree Examination - June 2022

#### Operating Systems - Elective 1 [MIS 510.1]

#### Marks: 100

Duration: 180 mins.

Friday, July 1, 2022

### Answer all the questions.

1)	Explain and differentiate between Batch processing system, Time sharing system, Distributed system, Real Time Systems with necessary diagram by highlighting the advantage and disadvantage. [TLO 1.1]	(10)
2)	Explain briefly roll of system calls and various types of system calls. [TLO 1.1]	(10)
3)	Define the necessity of scheduling queues, also with help of diagram explain queueing diagram for process scheduling. [TLO1.1]	(10)
4)	Explain briefly the various types of message passing system. [TLO2.1]	(10)
5)	Explain any two scheduling algorithm with context switching time with example.[TLO2.1]	(10)
6)	Write and Explain briefly the Dining philosopher problem for synchronization with necessary code and structures. [TLO1.2]	(10)
7)	Consider the following snapshot of a system (1+1+8 marks) [TLO 3.2] Allocation MAX Available	(10)
	A B C A B C A B C P0 0 1 0 0 1 1 1 5 2 P1 1 0 0 1 7 5 P2 1 1 5 2 3 5 P3 0 5 3 0 6 5 P4 0 1 1 1 4 5	
	<ul> <li>A, B and C are the resource types. P0, P1, P2, P3 and P4 are the 5 processes.</li> <li>The current allocation, the maximum resources required by each process and the available resources have been given. Answer the following questions using Bankers algorithm.</li> <li>(i) Determine the maximum number of resources of each type in the system.</li> <li>(ii) Determine the Need matrix.</li> <li>(iii) List the steps in determining whether the system is safe or not. Give the safe sequence if present.</li> </ul>	
8)	Explain the concept of virtual memory and demand paging. [TLO3.2]	(10)
9)	What is the necessity of using page replacement algorithm? Explain all related algorithms. [TLO3.2]	(10)
10)	Given memory partitions of 200K, 600K, 300K, 400K, 250K and 700K (in order), how would each of the First-fit, Best-fit and worst fit algorithms place the memory segments of processes of 256K, 220K 312K, 517K, 212K and 526K (in order)? In this case which algorithm makes most efficient use of memory? [TLO 3.1]	(10)

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