Paper ID: 44604		**L**	**T/P**	**C**
Code: IT604	**Paper: Operating System**	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Course Outcomes:

CO1	Understand the role of operating system in a computing device and scheduling of process over a processor
CO2	Ability to synchronize programs and make the system deadlock free. Ability to use concepts of semaphore and its usage in process synchronization
CO3	Ability to understand paging and segmentation methods of memory binding and their pros & cons
CO4	Ability to understand file system like file access methods, directory structures, file space allocation in disk and free space management in disk. Ability to understand disk scheduling and disk recovery procedures

Course Outcomes -Program Outcomes Matrix

Filled on a scale of 1 to 3 (3=High; 2=Moderate; 1=Low; '-'for no correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	1	-	1	1	-	1	1	-	-	-	-
CO2	-	1	-	1	2	-	1	1	-	-	-	-
CO3	-	1	-	1	1	-	1	1	-	-	-	-
CO4	-	1	-	1	1	-	1	1	-	-	-	-

UNIT 1

Introduction to the Operating System.Types of OS: Batch System, Time Sharing System, Real Time System, Multiuser/Single User SystemFunctions of Operating System: Process Management, Memory Management, File Management, I/O Devices Management, Information Management.

Process Management: Process concepts, Process State, Process Control Block, Context Switch, CPU Scheduling, Scheduling Criteria, Scheduling Algorithms, Pre-emptive/ Non Pre-emptive Scheduling, Threads, Thread Structure.

UNIT 2

Process Synchronisation: Critical Section Problem, Race Condition, Synchronisation Hardware, Semaphores, Classical Problems of Synchronisation.

DeadLock: Characterisation, Deadlock Prevention, Deadlock Avoidance, Detection and Recovery.

UNIT 3

Memory Management: Contiguous Allocation, External Internal Fragmentation, Paging, Segmentation, Segmentation with Paging, Virtual Memory Concept and its Implementation, Thrashing

UNIT 4

File Handling: Access Methods, Directory Structure, Allocation Methods - Contiguous Allocation, Linked Allocation, Indexed Allocation, Free Space Management.

Device Management: Disk Structure, Disk Scheduling Algorithms, Disk Management, Case study on Window and UNIX operating systems.

Text Books:

1. Silbershatz, Galvin and Gagne, "Operating Systems Concepts", Wiley, Ninth edition, 2012

Reference Books:

2. J. Archer Harris, "Operating Systems", McGraw Hill Education Private Limited, 2014
3. Flynn, Mchoes, "Understanding Operating System", Thomson Press, Third Edition, 2003
4. GodboleAhyut, "Operating System", PHI, 2003