Question Paper

Exam Date & Time: 07-Jul-2022 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
IV SEMESTER B.Sc. (Applied Sciences) in Engg.
END SEMESTER THEORY EXAMINATION - MAY/ JUNE 2022

OPERATING SYSTEMS [ICS 243]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Missing data may be suitably assumed

1) Explain any FOUR operating system services with examples. (4)

A)

B) Discuss how the following pairs of scheduling criteria conflict in certain settings. (3)
i) CPU utilization and response time.
ii) Average turnaround time and maximum waiting time.
iii) I/O device utilization and CPU utilization.

C) Give three advantages and disadvantages of multi-programming in operating system? (3)

2) A) The following snapshot of processes shown in Table Q. 2A are being scheduled using a pre-emptive round-robin scheduling algorithm. Each process is assigned a numerical priority, with a higher number indicating a higher relative priority. In addition to the processes listed below, the system also has an idle task (which consumes no CPU resources and is identified as Pidle). This task has priority 0 and is scheduled whenever the system has no other available processes to run. The length of a time quantum is 10 units. If a process is pre-empted by a higher-priority process, the pre-empted process is placed at the end of the queue. (4)

Processes	Priority	Burst	Arrival
1	40	20	0
2	30	25	25
3	30	25	30
4	35	15	60
5	5	10	100
6	10	10	105

Table Q. 2A

a) Show the scheduling order of the processes using a Gantt chart.
b) What is the turnaround time for each process?
c) What is the waiting time for each process?
d) What is the CPU utilization rate?

B) Explain all multithreading models with neat diagrams (3)