

U.G. 4th Semester Examination - 2021

COMPUTER SCIENCE

[PROGRAMME]

Course Code : COM.SC-G-CC-L-401D

(Operating Systems)

Full Marks : 30

Time : 1½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

1. Answer any **five** questions: 2×5=10
- a) What is batched operating system?
 - b) What are the responsibilities performed by operating system?
 - c) Explain the need of Bootstrap program in operating system.
 - d) Differentiate between multiprogramming and multiprocessing operating systems.
 - e) Write in short the Windows XP process scheduling techniques.

[Turn Over]

- f) Why threads are called light-weight processes?
- g) What is a real-time operating system?
- h) Name some shells of UNIX operating system.

GROUP-B

Answer any **two** questions: 5×2=10

- 2. Draw and explain the process state-transition diagram. 5
- 3. What are the different types of memory used in computer? Explain the memory hierarchy of computer system. 1+4
- 4. Consider the following page reference string:
1 1 2 1 2 4 3 3 4 6 4 4 3 3 4 3 5 5 4 5 3 6 6 2.
If the number of free frames in memory is 4 then find the number of page faults for the following page replacement strategies: FIFO and Least Recently Used (LRU). 2½+2½
- 5. Write a shell script to check whether a number is prime number or not. Number should be taken as command line argument. 5

6. Explain best fit, worst fit and first fit memory allocation techniques. 5

GROUP-C

Answer any **one** question: 10×1=10

7. Prepare a Gantt chart considering the arrival times and execution times for the following processes applying SJF and RR with time quantum 5 as processes scheduling policies. Calculate the average waiting time for each case. 5+5

Process	Execution time	Arrival time
P1	15	0
P2	10	5
P3	5	10
P4	20	15

8. a) What is time sharing system?
b) How operating system is protected from user access?
c) What is virtual memory?
d) What do you mean by system calls?
e) What is the job of a long-term scheduler?

2+2+2+2+2

9. Write short notes on any **two** of the following: 5×2=10

- a) Variable partition vs fixed partition
b) Pipes and filters
c) Pattern matching using grep command
d) Multithreaded system
