

C 60093

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Name.....

Reg. No.....

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH 2019

(CUCBCSS)

Computer Science

BCS 6B 13—FUNDAMENTALS OF OPERATING SYSTEM

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer all questions.
Each question carries 1 mark.*

1. What is an operating system ?
2. What is spooling ?
3. What do you mean by a process state ?
4. Which technique is employed to share the CPU among user programs ?
5. What is starvation ?
6. Which term is used to refer the state "no two processes are executing in their critical sections at the same time" ?
7. What is swapping ?
8. List any *two* strategies used to select a free hole from the set of available holes.
9. In an access matrix, what is the meaning of $(i, j)^{\text{th}}$ entry of the matrix.
10. Hardwares that support Android are mainly based on which architecture platform ?

(10 × 1 = 10 marks)

Part B

*Answer all questions.
Each question carries 2 marks.*

11. What are the various functions of an operating system ?
12. Briefly explain about the information contained in a PCB associated with a specific process.
13. Explain about multilevel feedback queue.
14. Explain the concept of overlays in memory management.
15. Differentiate between authentication and authorization.

(5 × 2 = 10 marks)

Turn over

Part C

Answer any five questions.

Each question carries 4 marks.

16. Write short notes on time sharing operating systems.
17. Explain about the fundamental state transitions for a process with a neat diagram.
18. How we can prevent the occurrence of a deadlock ?
19. Explain how semaphores can be used to solve the critical section problem.
20. Explain readers-writers problem. How will you solve this problem by introducing the concept of semaphore variables ?
21. Write various steps to handle a page fault by considering a page replacement policy.
22. Explain about various file allocation methods.
23. Explain about various mechanisms available for implementing security in an operating system.

(5 × 4 = 20 marks)

Part D

Answer any five questions.

Each question carries 8 marks.

24. Explain a deadlock avoidance algorithm.
25. Consider the following set of processes, with the length of the CPU burst time given in milliseconds.

<i>Process</i>	<i>Burst time</i>	<i>Priority</i>
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4 and P5 all at time 0 :

- (a) Draw Gantt charts illustrating the execution of these process using FCFS, SJF, a non-pre-emptive priority (a smaller priority number implies a higher priority) and RR (quantum = 1) scheduling.
- (b) What is the turnaround time of each process for each of the scheduling algorithms specified in a.

26. With the help of a neat diagram, explain about segmentation.
27. Explain Dining-Philosophers problem.
28. Explain various I/O management schemes.
29. Explain about any two page replacement algorithms.
30. Write short notes on :
 - (a) Basic File System and Logical File System.
 - (b) Critical section problem.
31. Write a note on the kernel architecture of the UNIX operating system.

(5 × 8 = 40 marks)