

Enroll No

K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar
 (An Empowered Autonomous Institute, Affiliated to SUK)
 End Semester Examination (Nov./Dec. 2025)
 S.Y.B.C.A. III

Q.P.Code
E 1174

Course Code: BC203

Course Name: Operating System

Day & Date: Thursday 06/11/2025
 Time : 2:30 To 5:30

Max Marks: 100

- Instructions:**
- 1) All questions are compulsory.
 - 2) Figures in rounded () brackets within the question, indicate the scheme of marking for respective part of the question, whereas figures in the first right column indicate total marks for that whole question.
 - 3) CO is the index number of the Course Outcome statement.
 - 4) The Bloom's taxonomy level (BL) for 1,2,3,4,5 and 6 is remember, understand, apply, analyse, evaluate and create respectively.
 - 5) Assume suitable data if necessary.
 - 6) Use of non-programmable calculators is allowed

Q.1 Attempt the Following Questions.

Marks	COs	BT Level
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- (a) Analyze the advantages and disadvantages of distributed systems compared to parallel systems. (1Mark For Each)

8 M	1	4
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OR

- (b) Compare Monolithic, Layered, and Microkernel OS architectures in terms of performance, security, and reliability. (2Marks For Each)

8 M	1	4
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- (C) Illustrate the services provided by an operating system with examples. (1 Marks for Every service)

7 M	1	2
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Q.2 Attempt the Following Questions.

- (a) Study service and cons of implementing all OS services in kernel space (monolithic) versus user space (microkernel). (1Mark For Each)

8 M	1	4
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OR

- (b) Analyze a given diagram of OS architecture and identify its main components. (1Mark For Each)

8 M	1	3
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- (C) Explain user-level and system-level services of an OS. How do they enhance program execution (1Mark For Each)

7 M	1	2
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Q.3 Attempt the Following Questions.

- (a) Design a scheduling algorithm that combines the fairness of Round Robin and the efficiency of Shortest Job First. (1Mark For Each)

8 M	2	6
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OR

- (b) Examine the use of IPC mechanisms in process synchronization. How does message passing differ from shared memory communication? (2Marks For Explanation & 6 Marks for difference)

8 M	2	4
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- (C) Explain the layered structure of an operating system. 7 M 1 2
(2 Marks for Diagram & 5 Marks for Explanation)

Q.4 Attempt the Following Questions.

- (a) Propose a deadlock recovery strategy for an operating system managing long-running batch processes (5 Marks). How would the strategy minimize job loss or delay? (3 Marks) 8 M 3 5

OR

- (b) Evaluate the pros and cons of using user-level threads over kernel-level threads. In which types of applications is each type preferable? (1Mark For Each) 8 M 3 5
(C) Describe the role of PCB in process management. (2Mark For Diagram & Explanation 5 Marks) 7 M 3 2

Q.5 Attempt Any Two Questions.

- (a) Explain the difference between logical and physical addresses with an example. (Difference 7 Marks & Diagram 3 marks) 10M 4 2
(b) Analyze the concept of paging and segmentation (5Marks). What are the advantages and disadvantages of each technique (5 Marks). 10M 4 4
(c) Explain the concept of swapping (7 Marks) with the help of a diagram (3 Marks). 10M 4 2

Q.6 Attempt Any TWO Questions.

- (a) Analyze the structure of a typical disk (5 Marks) and explain how its physical organization impacts data access times (5 Marks). 10M 4 4
(b) Describe the working of FCFS disk scheduling algorithm. (Explanation 5 Marks & Example 5 marks) 10M 4 2
(c) Evaluate the effectiveness of the SCAN and C-SCAN disk scheduling algorithms (6 Marks) in reducing average seek time. Which is better under heavy load and why? (4 Marks) 10M 4 4

