

R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT
(An Autonomous Institute U/s UGC Act 1956)

B.Voc. SEMESTER-III, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1SD302

DATE: 18-12-2025

SUBJECT NAME: OPERATING SYSTEM

TIME: 11:00 AM to 01:00 PM

TOTAL MARKS: 50

Instructions

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

		Marks	BL	CO
Q.1	(a) List and define functions of an operating system.	05	R	1
	(b) State the difference between a program and a process.	05	R	2
Q.2	(a) Explain the concept of a process in an operating system and describe the five states of a process with a simple diagram.	05	U	2
	(b) Apply the FCFS scheduling algorithm to find the average waiting time for a set of processes.	05	A	2
OR				
Q.2	(a) Explain Inter-Process Communication (IPC) and describe how processes share information with each other.	05	U	2
	(b) Use the SJF scheduling algorithm to calculate the turnaround time for the given processes.	05	A	2
Q.3	(a) Define the following terms:	05	R	3
	1. Page			
	2. Frame			
	3. Page Table			
	4. Logical Address			
	5. Physical Address			
	(b) A process refers to pages in the following order: 2, 3, 2, 1, 5, 2, 4, 5, 3, 2 Using 3 page frames, apply the FIFO and LRU page replacement algorithms to find the number of page faults.	05	A	3

OR

- Q.3 (a)** What is memory allocation? List and define the different memory allocation methods used in operating systems. **05 R 3**
- (b)** Given the following page reference string: **05 A 3**
 1, 4, 5, 2, 4, 3, 1, 2, 5, 4
 Using 3 page frames, apply FIFO and LRU algorithms and calculate the total page faults in each case.

- Q.4 (a)** Explain the different types of file access methods with suitable examples. **05 U 4**
- (b)** Apply your knowledge of directory structures to draw and explain any two types of directory structures with suitable examples or diagrams. **05 A 4**

OR

- Q.4 (a)** What is a Directory? Explain the various directory operations in simple terms with examples. **05 U 4**
- (b)** Illustrate and explain any two file allocation methods with the help of diagrams. **05 A 4**

- Q.5 (a)** Explain any five special features of the Android mobile operating system. **05 U 5**
- (b)** Apply UNIX commands pwd, cd, and mkdir to create and navigate folders in your own directory. Write the commands you would use and explain their output. **05 A 5**

OR

- Q.5 (a)** Describe the role of Antivirus as utility software with suitable examples. **05 U 5**
- (b)** Consider Linux shell commands to perform the following tasks and write the corresponding commands for any five task: **05 A 5**
 (i) Find details of a user
 (ii) Search a pattern in a file
 (iii) Change file permissions
 (iv) Display first few lines of a file
 (v) Extract specific columns from a file
 (vi) Count lines, words, and characters in a file
