

GYANMANJARI INNOVATIVE UNIVERSITY

Gyanmanjari Diploma Engineering College

Diploma Engineering End Semester Examination (ESE)-Summer - 2026

Enrollment No.: _____

Date: 13/05/2026

Subject Code: DETCE14207

Semester: 4

Subject Name: Operating System

Total Marks: 100

Time: 10:30AM To 01:30PM

Instructions:

1. Question No. 1 is Compulsory.
2. Make Suitable Assumptions wherever necessary.
3. Figures to the right indicate full marks.

	Marks
Q.1 (a) Define Operating System and give its goal. Operating System ની વ્યાખ્યા આપો અને તેના goals લખો.	05
(b) What is the First-Come, First-Served (FCFS) Scheduling algorithm, and what are its advantages and disadvantages? First-Come First-Served (FCFS) Scheduling Algorithm શું છે? તેના advantages અને disadvantages શું છે?	05
(c) Explain different types of OS and also Explain different types of tasks done by OS. Operating System ની વિવિધ પ્રકારો સમજાવો અને OS દ્વારા કરવામાં આવતા વિવિધ tasks સમજાવો.	10
Q.2 (a) What are race conditions, and how do they occur in concurrent processes? Race Conditions શું છે? અને concurrent processes માં તે કેવી રીતે થાય છે?	05
(b) What is Deadlock, and what are the necessary conditions for a deadlock to occur? Deadlock શું છે? અને Deadlock થવા માટેની necessary conditions શું છે?	05
OR	
(b) Write about various multithreading model. Various Multithreading Models વિશે લખો.	05
(c) Explain different services provided by operating system. Operating System દ્વારા આપવામાં આવતી services સમજાવો.	10
OR	
(c) What are the various process states in the Process Life Cycle? Process Life Cycle માં વિવિધ Process States શું છે?	10
Q.3 (a) Write a note on Resource Allocation Graph. Resource Allocation Graph વિશે note લખો.	05

- (b) Describe necessary conditions for Deadlock to occur. Deadlock થવો માટેની necessary conditions સમજાવો. 05
- (c) Explain Disk Scheduling Algorithm – SCAN, CSCAN. Disk Scheduling Algorithms – SCAN અને CSCAN સમજાવો. 10

OR

- (a) What is fragmentation? Explain in brief. Fragmentation શું છે? સંક્ષિપ્તમાં સમજાવો. 05
- (b) Draw Memory hierarchy. Memory Hierarchy નો diagram દોરો. 05
- (c) List out various file operations and describe various file attributes. Various File Operations લખો અને વિવિધ File Attributes સમજાવો. 10

- Q.4 (a) Give the Difference between Logical address and Physical Address. Logical address and Physical Address વચ્ચેનો ફરક લખો. 05
- (b) What is swapping? Why it is required? Swapping શું છે? અને તે કેમ જરૂરી છે? 05
- (c) Calculate average waiting time and average turnaround time for SJF and FCFS algorithm with gantt chart for following data. નીચે આપેલા data માટે SJF અને FCFS Scheduling Algorithm માટે Gantt Chart સાથે Average Waiting Time અને Average Turnaround Time ગણો. 10

Process	Arrival Time	Burst Time
P1	0	6
P2	1	4
P3	3	5
P4	5	3

OR

- (a) Write short note on virtual memory. Virtual Memory વિશે short note લખો. 05
- (b) Explain Allocation techniques First Fit, Best Fit and Worst Fit. Allocation Techniques – First Fit, Best Fit અને Worst Fit સમજાવો. 05
- (c) Calculate average waiting time and average turnaround time for SJF algorithm with gantt chart for following data. નીચે આપેલા data માટે SJF Scheduling Algorithm માટે Gantt Chart સાથે Average Waiting Time અને Average Turnaround Time ગણો. 10

- Q.5 (a) Differentiate: Linked allocation vs Indexed allocation. Linked Allocation અને Indexed Allocation વચ્ચેનો ફરક લખો. 05
- (b) Explain different page Replacement Algorithms in OS. Operating System માં વિવિધ Page Replacement Algorithms સમજાવો. 05

(c) Write a shell script to find maximum number from given three integer numbers. આપેલ ત્રણ integer numbers માંથી maximum number શોધવા માટે Shell Script લખો. 10

OR

(a) Explain Non-Contiguous memory allocation with Advantage and Disadvantage. Non-Contiguous Memory Allocation સમજાવો અને તેના advantages તથા disadvantages લખો. 05

(b) Explain directory structure used by Linux. Linux માં ઉપયોગમાં લેવાતી Directory Structure સમજાવો. 05

(c) Write a Shell script to find factorial of the given number. આપેલ number નો factorial શોધવા માટે Shell Script લખો. 10