STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086
(For candidates admitted from the academic year 2023 – 2024 and thereafter)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024
INFORMATION TECHNOLOGY

FIRST SEMESTER

COURSE : MAJOR CORE
PAPER : OPERATING SYSTEMS: CONCEPTS AND APPLICATIONS
SUBJECT CODE : 23CS/PC/OC14
TIME : 1 ½ HOURS **MAX. MARKS: 50**

Q. No.	SECTION A (6 X 5 = 30) Answer all the questions	CO	KL
1.	a) What are System Calls in Operating System support your answer with any two types of System Calls. **(OR)** b) What is the purpose of System Services? Brief about any two categories.	CO1	K1
2.	a) Explain the concept of a Process Control Block in Operating System with a clear diagram for Process State. **(OR)** b) Explain various file access permissions	CO2	K2
3.	a) Apply the directory structure with its levels in an example and explain. **(OR)** b) Apply contiguous allocation method of disk space in an example and explain.	CO3	K3
4.	a) Make use of Bankers algorithm in terms of safe state and explain. **(OR)** b) Identify the benefits of multiprogramming and time sharing in operating system architecture.	CO3	K3
5.	a) Analyse any two types of access methods in file organization. **(OR)** b) Examine how formal models of secure systems can be applied to improve the security of an operating system.	CO4	K4
6.	a) Compare Type 1 and Type 2 hypervisors **(OR)** b) Inspect the basic concept of Demand paging	CO4	K4
Q. No.	**SECTION B (2 x 10=20) Answer all the questions**	**CO**	**KL**
7.	a) Identify and explain the various file allocation methods. **(OR)** b) Apply and explain the concept of segmentation to support efficient memory management	CO3	K3

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<td>8.</td>
<td>a) Calculate completion time, turnaround time, waiting time and response time using SJF and Round Robin algorithms (time quantum = 4). Analyse which algorithm is best in terms of average waiting time.
<table>
<tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th></tr>
<tr><td>P1</td><td>0</td><td>3</td></tr>
<tr><td>P2</td><td>3</td><td>5</td></tr>
<tr><td>P3</td><td>2</td><td>7</td></tr>
<tr><td>P4</td><td>4</td><td>4</td></tr>
<tr><td>P5</td><td>1</td><td>5</td></tr>
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(OR)
b) Analyse critical section problem with a suitable example.</td>
<td>CO4</td>
<td>K4</td>
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