25804664

QP CODE: 25804664

Reg No : .....

Name : .....

I.M.C.A DEGREE EXAMINATION, OCTOBER 2025

Fifth Semester

Integrated MCA

CORE - IMCA5C02 - OPERATING SYSTEMS

2020 Admission Onwards

DC160C5B

Time: 3 Hours Maximum: 75 Marks

Part A

*Answer any **ten** questions*

*Each question carries **3** marks*

1. What are the advantages of Multiprogramming OS?
2. What is a command interpreter system?
3. Define System Call. What are the different types pf system calls available?
4. Distinguish beween the ready and running states of a process.
5. Explain Pre-emptive scheduling.
6. Explain the four conditions that must hold simutaneously for a deadlock to occur.
7. Explain how registers are used to implement page tables. What is the drawback of this method?
8. How is the address space partitioned and used while combining paging with segmentation.
9. Explain various directory structures.
10. Compare and contrast the strengths and weaknesses of various disk scheduling algorithms.
11. Describe the primary reasons for using distributed databases in modern information systems?
12. Briefly explain how OSI model relates to communication protocols.

(10×3=30 marks)

Part B

*Answer **all** questions*

*Each question carries **9** marks*

13. a) Explain in detail the design considerations while designing a Real-time opearting system.

OR

b) Explain the system calls used for communication.

14. a) a) Explain the lifecycle stages of a process with a neat diagram. b)Explain the various criteria considered while choosing a scheduling algorithm.

OR

b) Consider the following snapshot of a system.

Process	Allocation	Max	Available
	A B C	A B C	A B C
P0	0 1 0	7 5 3	3 3 2
P1	2 0 0	3 2 2	
P2	3 0 2	9 0 2	
P3	2 1 1	2 2 2	
P4	0 0 2	4 3 3	

Answer the following questions using Banker's algorithm:

i) What is the content of the Need Matrix?

ii) Is the system in a safe state? if yes, give the safe sequence.

iii)Can a request for (3,3,0) by P4 be granted immediately?

15. a) Explain how paging is implemented with Translation Lookaside Buffer.

OR

b) Explain various page replacement algorithm with an example.

16. a) Discuss and compare the most common schemes used for defining the logical structure of directories in file systems.

OR

b) What is disk scheduling? Explain common disk scheduling algorithms with suitable example.

17. a) What are communication strategies in the context of distributed operating systems? Explain.

OR

b) Can you outline the primary distinctions in user experience and device compatibility between Desktop OS, Android, and iOS, and discuss which environment you find more suitable for different types of tasks and why?

(5×9=45 marks)