Total No. of Questions: 22

Enrollment No : _____

MEDICAPS UNIVERSITY

Faculty of Engineering

End Semester Examination May 2025

IT3CO21 Operating System

Programme	:	B.Tech.	**Branch/Specialisation**	:	IT
Duration	:	3 hours	**Maximum Marks**	:	60

Note: *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

Section 1 (Answer all question(s))

		Marks	CO	BL
Q1.	Which of the following is not an operating system? ○ Linux ○ DOS ◉ Oracle ○ Windows	1	1	1
Q2.	The object code is then passed through a program called a _____ which turns it into an executable program. ○ Integer ○ Source code ◉ Linker ○ None of the above	1	1	1
Q3.	CPU scheduling is the basis of _____. ○ Multiprocessor systems ◉ Multi programming operating systems ○ None of the mentioned ○ Larger memory sized systems	1	2	1
Q4.	When a process is in a "Blocked" state waiting for some I/O service. When the service is completed, it goes to the _____. ○ Terminated state ○ Suspended state ○ Running state ◉ Ready state	1	2	1
Q5.	The phenomenon, in which there is wasted space internal to a partition due to the fact that the block of a data loaded is smaller than the partition, is referred to as _____. ○ External fragmentation ○ Simple fragmentation ○ Dynamic fragmentation ◉ Internal fragmentation	1	2	1
Q6.	_ is the techniques for overcoming the external fragmentation in which the operating system shifts the processes so that they are contiguous and so that all of the free memory is together in one block. ○ Transformation ○ Shifting ◉ Compaction ○ Extraction	1	2	1
Q7.	Which of the following page replacement algorithms suffers from Belady's Anomaly? ○ Optimal replacement ○ LRU ○ Both optimal replacement and FIFO ◉ FIFO	1	1	1
Q8.	is the concept in which a process is copied into the main memory from the secondary memory according to the requirement. ○ Paging ◉ Demand paging ○ Swapping ○ Segmentation	1	2	1
Q9.	Which of following basic operations that can be performed on files by the operating System's system calls? ○ Delete, Truncate files, Sorting ◉ Read, Write, Delete ○ Write, Paint, Reposition ○ All of the above	1	2	1

Q10. In the _ algorithm, the disk arm starts at one end of the disk and moves toward the other end, servicing requests till the other end of the disk. At the other end, the direction is reversed and servicing continues. **1 2 1**

- ○ LOOK
- ○ C-SCAN
- ○ C-LOOK
- ◉ SCAN

Section 2 (Answer all question(s))

Marks CO BL

Q11. Define the term Linker and Loader. **2 1 1**

Rubric	Marks
Define the Linker	1
Define the Loader	1

Q12. Explain language processors and its types. **3 2 1**

Rubric	Marks
what is language processors	1
types of language processors	2

Q13. (a) What is an operating system? What are functions of the operating system? **5 2 1**

Rubric	Marks
Define OS	1
Functions of OS	4

(OR)

(b) Explain different types of OS in detail.

Rubric	Marks
what is os	1
Types of OS	4

Section 3 (Answer all question(s))

Marks CO BL

Q14. Define process and draw process states chart diagram. **2 2 1**

Rubric	Marks
Define process	1
Draw process states chart diagram.	1

Q15. (a) Explain deadlock avoidance using banker's algorithm in details. **8 3 1**

Rubric	Marks
what is Deadlock	2
Explain banker's algorithm	6

(OR)

(b) Consider 3 processes P1, P2 and P3, which require 5, 7 and 4 time units and arrive at time 0, 1 and 3. Draw the Gantt chart, process completion sequence and average waiting time for-
(i) Round robin scheduling with CPU quantum of 2 time units.
(ii) FCFS.

Rubric	Marks
Solve with Round Robin	5
Solve with FCFS	3

Section 4 (Answer all question(s))

Q16. Explain the term internal and external Memory Fragmentation. **Marks CO BL**
3 2 1

Rubric	Marks
What is Memory Fragmentation.	1
Define internal and external Memory Fragmentation.	2

Q17. (a) What is paging? Discuss basic paging technique in detail. **7 4 1**

Rubric	Marks
What is paging	2
Define paging technique	5

(OR)

(b) Given memory partition of 100K, 500K, 200K, 300K, and 600K in order, how would each of the First-fit, Best-fit and Worst-fit algorithms place the processes of 212K, 417K, 112K and 426K in order? Which algorithm makes the most efficient use of memory? Show the diagram of memory status in each case.

Rubric	Marks
Calculate using First-fit, Best-fit and Worst-fit algorithms	5
Show the diagram of memory status in each case.	2

Section 5 (Answer all question(s))

Q18. Explain the goals of Operating System Security in detail. **Marks CO BL**
4 4 1

Rubric	Marks
What is OS	1
Define the goals of Operating System Security.	3

Q19. (a) Explain the following: **6 5 1**
(i) Virtual Memory
(ii) Demand Paging
(iii) Cache Memory

Rubric	Marks
Define Virtual Memory	2
Define Demand Paging	2
Define Cache Memory	2

(OR)

(b) Calculate page faults for (LRU, FIFO, OPT) for following sequences where page frame is three.
0,1,2,1,4,2,3,7,2,1,3,5,1,2,5.

Rubric	Marks
solve with LRU	2
solve with FIFO	2
solve with OPT	2

Section 6 (Answer any 2 question(s))

Marks CO BL

Q20. Explain file allocation methods in detail. **5 5 1**

Rubric	Marks
Explain the term file system	1
Define file allocation methods	4

Q21. Explain the following disk scheduling algorithm with examples: **5 5 1**
(i) SSTF (ii) SCAN (iii) FCFS

Rubric	Marks
Define the term disk scheduling	2
Explain (a) SSTF (b) SCAN (c) FCFS	3

Q22. Explain different directory structures in detail. **5 5 1**

Rubric	Marks
What is directory?	1
Define different directory structures.	4

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