



**2022/TDC/ODD/SEM/CSCHCC-303T/087**

**TDC (CBCS) Odd Semester Exam., 2022**

**COMPUTER SCIENCE**

**( Honours )**

**( 3rd Semester )**

**Course No. : CSCHCC-303T**

**( Operating System )**

**Full Marks : 70**

**Pass Marks : 28**

**Time : 3 hours**

*The figures in the margin indicate full marks for the questions*

**UNIT—I**

**1. Answer any two of the following questions :**

**2×2=4**

(a) Write the functions of OS as user point of view.

(b) "Operating system acts as a resource manager." What types of resources are managed by an operating system?



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(c) What are the services provided by the system call?

2. Answer any one of the following questions : 10

(a) Discuss the different types of operating system. 10

(b) (i) How is the dual mode operation useful in an OS? Explain these operations. 2

(ii) What are single user and multiuser OS? Give example of each. 8

UNIT—II

3. Answer any two of the following questions : 2×2=4

(a) Define process. What are the four sections of memory allocated for a process?

(b) What do you mean by context switching?

(c) What is the problem in priority scheduling algorithm? How do you overcome this problem?

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4. Answer any one of the following questions : 10

(a) Consider the following processes along with their arrival time and CPU burst time :

Process	Arrival Time	CPU Burst Time
P <sub>1</sub>	0	8
P <sub>2</sub>	1	4
P <sub>3</sub>	2	9
P <sub>4</sub>	3	5

Draw Gantt chart using FCFS, SJF and RR (time slice = 4 ms) scheduling. Also calculate the average waiting and turnaround time of each scheduling. Which scheduling does achieve lowest amongst waiting and turnaround time?

$$2+2+2+2=10$$

(b) (i) What is PCB? What kind of informations does a PCB contain? 4

(ii) Define scheduler. Explain the different types of schedulers. 6

UNIT—III

5. Answer any two of the following questions : 2×2=4

(a) What is process synchronization? Give example.



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- (b) Write down the solutions of critical section problem.
- (c) How does OS handle deadlock?

6. Answer any one of the following questions : 10

- (a) (i) Define IPC in OS. Explain how IPC takes place between two processes. 5
- (ii) Discuss one classical synchronization problem. 5
- (b) (i) Write a short note on resource allocation graph (RAG). 5
- (ii) Consider the following resource allocation table :

Process	Allocation			Max.			Available		
	A	B	C	A	B	C	A	B	C
P <sub>0</sub>	1	1	2	4	3	3	2	1	0
P <sub>1</sub>	2	1	2	3	2	2			
P <sub>2</sub>	4	0	1	9	0	2			
P <sub>3</sub>	0	2	0	7	5	3			
P <sub>4</sub>	1	1	2	1	1	2			

Apply Banker's algorithm to—

- (1) calculate the content of the need matrix;
- (2) check if the system is in a safe state;
- (3) determine the total number of resources of each type (A, B and C). 1+3+1=5

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UNIT—IV

7. Answer any two of the following questions :

2×2=4

- (a) Write down the functions of memory management.
- (b) Define compaction.
- (c) Differentiate between internal and external fragmentation.

8. Answer any one of the following questions : 10

- (a) Write short notes on any two of the following : 5×2=10
  - (i) Swapping
  - (ii) Segmentation
  - (iii) Virtual memory
  - (iv) Demand paging
- (b) What are logical and physical address in operating system? Explain the difference between logical and physical address. 4+6=10



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UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) What is a file? Mention different attributes of a file.

(b) What do you mean by authentication in OS?

(c) How do you protect your files?

10. Answer any *one* of the following questions : 10

(a) Explain the different file access methods.

(b) Discuss various types of directory structure in an OS.

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