TDC (CBCS) Odd Semester Exam., 2019

COMPUTER SCIENCE

(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) What are the different modes of operation of operating system? Explain these modes of operation.

(b) Explain the mechanism of execution of a system call.

(c) What is an operating system? Give example.

2. *(a)* What are process creation and process termination? 4

(b) Explain the function of operating system. 6

OR

3. *(a)* Distinguish between multiprogramming and timesharing. 4

(b) What is multithreading? Explain the roles of fork() and exec() system calls in a multithreaded program. Give suitable example to demonstrate the functions. 6

UNIT—II

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

(a) What is thread? Give advantage of thread over process.

(b) What is preemptive scheduling? Give example.

(c) Define process abstraction.

5. *(a)* Explain the concept of process. Describe the contents of process control block (PCB). 6

(b) For the given process information, calculate the waiting time and turnaround time by applying SJF (preemptive) scheduling : 4

Process	*Arrival time*	*Burst time*
P_1	0	6
P_2	2	3
P_3	3	2
P_4	4	2

OR

6. *(a)* Consider the following set of processes with the length of the CPU-burst time given in milliseconds :

Process	*Burst time*	*Priority*
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

Draw Gantt charts and find the turnaround time of each process illustrating the execution of these processes using FCFS, a non-preemptive priority and RR (quantum = 1) scheduling. 6

(b) Differentiate among short-term, long-term and medium-term scheduling. 4

UNIT—III

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

(a) What do you mean by concurrent processes?

(b) What is the meaning of the term 'busy waiting'?

(c) Explain resource allocation graph.

8. (a) What is deadlock? Explain the necessary conditions for its occurrence. How can deadlocks be prevented? 2+4=6

(b) What do you mean by mutual exclusion of processes? Under what condition it is necessary ? Explain with an example. 4

OR

9. (a) What is critical section problem? Explain a method to solve the critical section problem. 6

(b) Write the advantage and disadvantage of shared memory communication. 4

UNIT—IV

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

(a) Distinguish between logical address space and physical address space.

(b) Define hit ratio.

(c) What is page fault?

11. (a) Explain the different strategies to allocate contiguous memory. 4

(b) Given memory partitions of 100 K, 500 K, 200 K, 300 K and 600 K (in order). How would each of first-fit, best-fit and worst-fit algorithms place processes of 212 K, 417 K, 112 K and 426 K (in order)? Which algorithm makes the most efficient use of memory? 6

OR

12. (a) What is segmentation? Explain its advantages and disadvantages. 4

(b) What is virtual memory? How can it be implemented? What are its benefits? 6

UNIT—V

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

(a) What is file allocation table (FAT)?

(b) What is the advantage of acyclic graph directory?

(c) What are the basic attributes of file?

14. *(a)* Discuss file space allocation method. 6

(b) Explain protect mechanism of file system. 4

OR

15. *(a)* Explain various access mechanisms of files. 6

(b) Explain 'tree-structured' directory structure with a neat diagram. 4

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