Total number of printed pages = 7

19/4th Sem/DCSE 404

2022

OPERATING SYSTEM

Full Marks – 100

Time – Three hours

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

Answer any *five* questions.

1. **A. Multiple choice questions :** 1×10=10

(i) What is an Operating system ?

(a) collection of programs that manages hardware resources

(b) system service provider to the application programs

(c) interface between the hardware and application programs

(d) All of the mentioned above

[Turn over

(ii) To access the services of operating system, the interface is provided by the _____.

(a) System calls

(b) API

(c) Library

(d) Assembly instructions

(iii) What is the main function of the command interpreter ?

(a) to get and execute the next user-specified command

(b) to provide the interface between the API and application program

(c) to handle the files in operating system

(d) None of the mentioned above

(iv) In operating system, each process has its own _____.

(a) address space and global variables

(b) open files

(c) pending alarms, signals and signal handlers

(d) All of the mentioned above

(v) In Unix, which system call creates the new process ?

(a) Fork

(b) Create

(c) New

(d) None of the mentioned above

(vi) What is the ready state of a process ?

(a) when process is scheduled to run after some execution

(b) when process is unable to run until some task has been completed

(c) when process is using the CPU

(d) None of the mentioned above

(vii) What is inter-process communication ?

(a) communication within the process

(b) communication between two processes

(c) communication between two threads of same process

(d) None of the mentioned above

(viii) The address of the next instruction to be executed by the current process is provided by the _____.

(a) CPU registers

(b) Program counter

(c) Process stack

(d) Pipe

(ix) The interval from the time of submission of a process to the time of completion is termed as _____.

(a) waiting time

(b) turnaround time

(c) response time

(d) throughput

(x) Which algorithm is defined in Time quantum ?

(a) shortest job scheduling algorithm

(b) round robin scheduling algorithm

(c) priority scheduling algorithm

(d) multi-level queue scheduling algorithm.

B. Short questions : 2×5=10

(i) What is the difference between process and program ?

(ii) What do you mean by a system call ?

(iii) What is process control block ?

(iv) What is a critical region ?

(v) What is meant by context switch ?

2. (a) What is an Operating System ? Explain how operating system acts as resource manager. 10

(b) What is a process ? Explain the various states of process with state transition diagram. 10

3. (a) What are the two different types of scheduling algorithms ? Give examples for each. 5

(b) Consider the following five processes and their burst time : 10

Process	Burst time
A	8
B	4

Process	Burst time
C	6
D	2
E	4

Calculate the average turn around time and waiting time for those processes with shortest job first and first come first serve scheduling algorithm.

(c) Discuss how shortest job first scheduling is more optimal than first come first serve with suitable example. 5

4. (a) What is a race condition ? What are the four different conditions need to hold for avoiding race condition. 10

(b) Explain how we can achieve mutual exclusion by using the critical section concept. 5

(c) What is disable interrupt approach to avoid the race condition ? Write the disadvantages of it. 5

5. (a) What is a deadlock ? Write the necessary conditions that cause deadlock situation to occur. 10

(b) How does deadlock avoidance differ from deadlock prevention ? 5

(c) Discuss the four different conditions for which the processes terminated. 5

6. Write short notes on any *four* : 5×4=20

(i) Process hierarchy

(ii) Inter-Process Communication

(iii) Timesharing Vs. Multiprogramming

(iv) Spin lock

(v) Process creation events.