

Total No. of Questions : 7]

SEAT No. :

PA-3403

[Total No. of Pages : 3

[5919]-21

M.Sc. (Computer Science)

CSUT 121 : ADVANCED OPERATING SYSTEM

(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question 1 is compulsory.*
- 2) *Solve any five questions from question 2 to 7.*
- 3) *Question 2 to 7 carry equal marks.*

Q1) Attempt any FIVE of the following : **[5 × 2 = 10]**

- a) What is the difference between zombie and orphan process?
- b) List any four features of Linux OS.
- c) What is hard link?
- d) Justify : In linux the files are usually accessed via file names.
- e) Write any four memory allocation mechanisms supported by linux.
- f) How linux uses opportunistic allocation?

Q2) Attempt the following :

- a)
 - i) Explain structure of a buffer header. Also explain how kernel maintains the buffer cache. **[4]**
 - ii) What is data segment? How to manage it? **[3]**
- b) Explain the following system calls : **[5]**
 - i) vfork()
 - ii) execl()
 - iii) exit()
 - iv) wait()
 - v) waitpid()

P.T.O.

Q3) Attempt the following :

- a) i) Discuss the architecture of Unix. [4]
ii) Explain the behavior of following C program. [3]

```
main()
{
int fd1, fd2;

char buf1 [512], buf2 [1024];

fd1 = fopen ("etc/passwd", O_RDONLY);
fd2 = fopen ("etc/passwd", O_RDONLY);

read (fd1, buf1, sizeof (buf1));
read (fd2, buf2, sizeof (buf2));

}
```

- b) What is the use of `atexit()` function? Write a C program to demonstrate the use of `atexit()` system call. [5]

Q4) Attempt the following :

- a) i) Discuss the concept of signal set. [4]
ii) Write a short note on `dup()` & `dup2()` system call. [3]
b) Explain `calloc()` and write a C program to demonstrate the use of `calloc()`, `free()` system calls. [5]

Q5) Attempt the following :

- a) i) Explain `nice()`, `getpriority()` and `setpriority()` system calls. [4]
ii) Explain `rmdir()` and `mkdir()` functions. [3]
b) Write a C program to demonstrate race condition in catching signals. [5]

Q6) Attempt the following :

- a) i) What is meant by process? Elaborate the various process states with the help of diagram. [4]
- ii) What is signal? Explain various methods of handling signals. [3]
- b) Write a C program to handle the two-way communication between the parent & child using pipe. [5]

Q7) Write short notes on any two of the following :

- a) Setting user ID and setting group ID. [6]
- b) Process creation and process termination. [6]
- c) Blocking the signal and retrieving pending signals. [6]

