

## GANPAT UNIVERSITY

## M. TECH. SEMESTER: II INFORMATION TECHNOLOGY

REGULAR EXAMINATION APRIL – JUNE 2016

## 3IT202: ADVANCED OPERATING SYSTEM

Max. Time: 3 hours

Max. Marks: 60

- Instructions:**
1. This Question paper has two sections. Attempt each section in separate answer book.
  2. Figure to the right indicates full marks.
  3. Be precise and to the point in answering the descriptive questions.

## SECTION – I

- Que. – 1
- A. Write an algorithm to release in-core Inode. [5]
- B. Explain the block diagram of Unix system kernel in detail. [5]

OR

- Que. – 1
- A. Explain race condition in assigning Inodes with diagram. [5]
- B. Describe algorithm for buffer allocation (getblk). [5]
- Que. – 2
- A. What is buffer cache? Describe its advantages and disadvantages. [5]
- B. Give the syntax of PIPE() system call. Write a program that performs read and write through unnamed pipe. [5]

OR

- Que. – 2
- A. Discuss the deadlock scenario for link system call using example. [5]
- B. Discuss the process states and its transition with diagram. [5]
- Que. – 3
- A. Draw the data structure for the scenario given below and comment on the content of buf1 and buf2. [5]

```

int i, j;
char buf1[512], buf2[512];
i = open("/etc/test", O_RDONLY);
j = dup(i);
read(i, buf1, sizeof(buf1));
read(j, buf2, sizeof(buf2));
close(i);

```

- B. Describe the fields of super block and discuss the case of how an Inode is assigned to new file when super block list of free nodes is empty. [5]

## SECTION – II

- Que. – 4** A. What are the different contexts of process? Discuss its in detail. [5]
- B. Write a program that uses standard output descriptor 1 to write text to pipe and standard input descriptor 0 to read from pipe using DUP() system call. [5]

OR

- Que. – 4** A. Discuss the algorithm of attaching region to the process. [5]
- B. Write a syntax of EXIT() system call. Also write its algorithm. [5]
- Que. – 5** A. What is importance of process scheduling? Discuss range of process priorities. [5]

- B. Write an algorithm of handling protection fault. Consider the scenario in which three processes shared the physical memory page whose copy on write bit is set and one of the three processes wants to modify the shared page which incurs the protection fault. Using diagram show the situation before and after occurrence of protection fault for given scenario. [5]

OR

- Que. – 5** A. Design an algorithm for allocating and freeing memory pages and page tables. [5]
- B. Explain fair share scheduler with suitable example. [5]

- Que. – 6** A. Write a program that creates  $n$  new processes ( $n$  will be entered by user) and kills half of the processes. Don't uses kill call in loop. [5]
- B. Write an algorithm to allocate space from Maps. Consider the initial map entry with address 1 and unit 5000. Show the map entry at each stage if there is request of 100, 50, 200, and 150 units of space. Also show the map entry if kernel free the 50 units at address 151. [5]

----- END OF PAPER -----