Seat No_____

GANPAT UNIVERSITY
M.Tech. Semester II Examination
May-June – 2014
3IT202: Advanced Operating Systems

Max Time : 3 Hour] **[Total Marks : 70**

Instructions:
1. All questions are compulsory
2. Figures to the right indicate full marks.
3. Answer Both Sections in Separate Answer sheets.

SECTION-I

Q-1

[A] What is the difference between bread and breada? Suppose the kernel does a delayed write of a block. What happens when another process takes that block from its hash queue? From the free list? **6**

[B] How to access Direct and Indirect blocks in Inode? Discuss with suitable example and role of bmap in that. **6**

[OR]

Q-1

[A] Exemplify five buffer allocation scenarios with suitable description. **6**

[B] Write an algorithm for the allocation of In-Core Inodes. **6**

Q-2

[A] Write a program illustrating the usage of Dup system call. Draw the kernel data structure after Dup. **6**

[B] How to request and free the disk blocks using suitable example. **5**

[OR]

Q-2

[A] Write the open algorithm and draw the data structure for the scenario given below: **6**

```
Process1 :
        fd1=open("/etc/passwd",O_RDONLY);
        fd2=open("/etc/public",O_RDONLY);
        fd3=open("local",O_RDWR);
        fd4= open("/etc/passwd",O_WRONLY);
Process 2:
        fd1=open("/etc/passwd",O_RDONLY);
        fd2=open("private",O_RDWR);
        close(fd1); close(fd2);
```

[B] What are the differences between named and unnamed pipes ? Write algorithm for the creation of unnamed pipes. **5**

Q-3

[A] Program for 'wait' system call in parent such that child runs first.In the child process, a SIGINT is send to the child process itself. **6**

[B] Draw the block diagram of the System Kernel. Prepare table of system calls and lower level algorithms associated with each sub-parts. **6**

SECTION – II

Q-4

[A] Trace the syscall algorithm for the following programme: **6**

```
char name[] = "file";
main(){
   int fd;
   fd=create(name,0666);}
```

[B] Write the algorithm for Init. **6**

[OR]

Q-4

[A] Suppose the kernel wants to load text of size 7K into region that is attached at virtual address 0 of a process but wants to leave a gap of 1k byes at the beginning of region. Name the algorithms that are invoked in sequence. Graphically show the how to load text into Region. **6**

[B] Trace the Exec algorithm for following program. **6**

```
main(){
  int status;
  if(fork()==0)
     exec("/bin/date","date",0);
  wait(&status);}
```

Q.5

[A] Calculate and draw the scheduling priorities for 3 processes A,B,C under following assumptions. Use Fare Share Scheduler. **6**

Suppose Process A is one group and Processes B and C are in another group. Kernel schedules Process A first. They are created simultaneously with initial priority 60, the highest user level priority is 60, the clock interrupts the system 60 times a second. Calculate delay of CPU usage, priority and group priority for [Zero] 0 to 5 time unit.

[B] Under what condition kernel swaps process out? Discuss an example of mapping in-core images of process onto a swap device. **5**

[OR]

Q-5

[A] What is demand paging? What are major data structures used by demand paging? Draw the relationship of data structure for demand paging. **6**

[B] Write process scheduling algorithm classifying graphically range of process priorities. **5**

Q.6

[A] Program in which a shared memory is created and attached and then fork() system call is made. **6**

[B] Draw 9 states UNIX process state transition diagram with clearly marking the transitions and state responsible for checking and handling the signals. **6**

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