

**SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI**

**Summer 2020 Examination**

**H.V.P.Mandal's College of Engineering & Technology Amravati**

**Course: Computer Science & Engineering**

**BE Four Year Sixth Semester (Computer Science & Engineering) Summer 2020 Exam**

**6KS01 Operating Systems**

**ASSIGNMENT ONLY FOR BACKLOG STUDENTS**

**Marks: 20**

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**Note:**

**1. Solve any Two Questions.**

**2. Each Question carries 10 Marks**

**Question No1.(10 Marks)**

- |                                                                                                                                                                                                         |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| a) What are the five major activities of an operating system in regard to process management?                                                                                                           | (2M) |
| b) Define Throughput and Waiting time.                                                                                                                                                                  | (2M) |
| c) Calculate the number of page faults for the following reference string for 4 frames using <b>FIFO page Replacement algorithm</b><br>Reference String: 1,2,3,4,1,2,5,1,2,3,4,5<br>Number of Frames: 4 | (2M) |
| d) List the various File Operations                                                                                                                                                                     | (1M) |
| e) What are the three reasons for which buffering is done                                                                                                                                               | (2M) |
| f) What does fork system call return to parent process on success?<br>(Write the appropriate option from the following<br>a. 0    b. -1    c. 1    4. Child Process ID )                                | (1M) |

**Question No.2.(10 Marks)**

- |                                                                                                                                                                                                                          |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| a) Explain three main advantages of Multiprocessor systems.                                                                                                                                                              | (2M) |
| b) List the three requirements that must be satisfied by critical-section problem solution.                                                                                                                              | (2M) |
| c) Calculate the number of page faults for the following reference string for 3 frames using <b>LRU page Replacement algorithm</b> .<br>Reference String: 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1<br>Number of Frames: 3 | (2M) |
| d) File type can be represented by _____<br>(Write the appropriate option from the following<br>a) file name b) file extension c) file identifier d) none of the mentioned )                                             | (1M) |
| e) List Five Services Provided by Kernel I/O Subsystem                                                                                                                                                                   | (1M) |
| f) What are the three Primary Components of Linux Operating System                                                                                                                                                       | (2M) |

**Question No3.(10 Marks)**

- a) List the services provided by an Operating System? (2M)
- b) For the following processes (2M)
- | <u>Process</u> | <u>Burst Time</u> |
|----------------|-------------------|
| P1             | 15                |
| P2             | 10                |
| P3             | 5                 |
- Calculate turnaround time of each process and average turnaround time for Shortest Job First (SJF) Scheduling Algorithm.
- c) Consider a paging system with 75 percent hit ratio, (1M)  
if it takes 10 nanoseconds to Search TLB and 500 nanoseconds to access memory, calculate the effective access.
- d) Explain Two Level Directory Structures (2M)
- e) On a disk with 200 Cylinders numbered 0 to 199, (2M)  
compute the number of tracks the disk arm must move to satisfy all the request in the disk queue **Using Shortest Seek Time First disc Scheduling Algorithm**  
The current head position is at 53.  
the Queue in FIFO order contains I/O request : 98,183,37,122,14,124,65,67
- f) Linux is Which Type of Operating System? (1M)  
(Write the appropriate option from the following  
a. single user, single tasking   b. single user, multitasking  
c. multi user, single tasking   d. multi user, multitasking

**Question No 4 .(10 Marks)**

- a) Explain Process Control Block (PCB)? (2M)
- b) Consider the following snapshot of a system,
- |    | <u>Allocation</u> |          |          | <u>Max</u> |          |          | <u>Available</u> |          |          |
|----|-------------------|----------|----------|------------|----------|----------|------------------|----------|----------|
|    | <u>A</u>          | <u>B</u> | <u>C</u> | <u>A</u>   | <u>B</u> | <u>C</u> | <u>A</u>         | <u>B</u> | <u>C</u> |
| P0 | 1                 | 1        | 2        | 4          | 3        | 3        | 2                | 1        | 0        |
| P1 | 2                 | 1        | 2        | 3          | 2        | 2        |                  |          |          |
| P2 | 4                 | 0        | 1        | 9          | 0        | 2        |                  |          |          |
| P3 | 0                 | 2        | 0        | 7          | 5        | 3        |                  |          |          |
| P4 | 1                 | 1        | 2        | 11         | 2        | 3        |                  |          |          |
- What is the content of need matrix? (2M)
- c) Assuming 1KB page size, what are the page numbers and offset for the following address references (2M)
- i. 2375  
ii. 19366
- d) List the various File Attributes (1M)
- e) What is the difference between SCAN AND C-SCAN Scheduling (2M)
- f) State True or False (Debian, Redhat, Ubuntu, Fedora, Kali are the flavours of Linux operating system)? (1M)