**DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY**

Department of Computer Science & Engineering

**UNIT WISE QUESTION BANK**

Name of the Program : B.Tech in CSE(AI&ML) Academic Year : 2023-24

Year & Semester : III Year I Semester Section: A No of Credits: 03

Name of the Course : Operating Systems Code : R20C302

Course: **Core** /Elective/Allied/Humanities/Management Regulation : R20

Course Area/Module : No of students registered : 62

Name of the Faculty : Mrs.A.Sri Chaitanya Designation : Asst. Professor

**UNIT-I**

1.With a neat sketch, Explain in detail about the interrelation between various services provided by the operating system

**[BTL2, Understanding, PSO 1,2]**

2.Write the difference between the function and system call. Briefly explain the six major categories of system calls.

**[BTL2, Understanding, PSO 1,2]**

3.List out and discuss the Operating system structure with neat diagrams.

**[BTL2, Understanding, PSO 1,2]**

4.Define the essential properties of the following types of operating systems:i) Batch ii) Interactive iii) Time sharingiv) Real time v) Parallelvi) Distributed

**[BTL2, Understanding, PSO 1,2]**

5.Explain about Storage management with neat diagram?

[**BTL2, Understanding, PSO 1, 2]**

6.List out Operating system Operations in detail?

**[BTL2, Understanding, PSO 1, 2]**

7.Explain about Operating system Services in detail?

**[BTL2, Understanding, PSO 1,2]**

8.Explain about any 3 computing Environments in detail?

**[BTL2, Understanding, PSO 1, 2]**

9.Define system call and list out different system calls.

**[BTL2, Understanding, PSO 1, 2]**

10.What is an operating system, Explain about different operating systems?

**[BTL2, Understanding, PSO 1, 2]**

11.Explain about Open source operating systems in detail?

**[BTL2, Understanding, PSO 1, 2]**

12.Define Operating system structure with neat diagrams.

**[BTL2, Understanding,PSO 1, 2]**

**UNIT-II**

1.What is critical section problem? Write and explain Peterson’s solution for it.

**[R20C203.2, BTL 3,Applying,PO1 , PSO 1,2 ]**

2. How to prevent necessary and sufficient conditions of deadlock? Explain.

**[R20C203.2, BTL 3,Applying,PO1 , PSO 1,2]**

3. Consider the following four processes represented as (Process, Arrival Time, Burst Time) with the length of CPU burst in milliseconds. { ( P1, 0, 10), (P2, 1, 7), (P3, 2, 13), (P4, 3, 11) }. Using preemptive SJF scheduling: i) Draw Gantt chart. ii) Calculate average waiting time.

**[R20C203.2, BTL 3, Applying, PO1, PSO 1,2]**

**4.** Explain the usage and structure of Semaphores with an example.Define short-term, medium-term, and long-term scheduling.

**[R20C203.2, BTL 3, Applying, PO1, PSO 1,2]**

5. Explain different process states with neat sketch.Explain how multiprogramming increases the utilization of CPU?

**[R20C203.2, BTL 3, Applying /PO1, PSO 1,2]**

6. Explain the Round Robin scheduling algorithm with a suitable example.

**[R20C203.2, BTL 3, Applying /PO1, PSO 1,2]**

7. a) Define dead locks with example.

b) Discuss how the following pairs of scheduling criteria conflict in a certain settings.

i) CPU utilization and response time, ii) Average turnaround time and maximum waiting time, and iii) I/O device utilization and CPU utilization. **[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2]**

8.Explain about Priority Scheduling algorithm with an Example?

**[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2]**

9.a) Define process and Process Control Block ?

b)Explain about Process Synchronization in detail?

**[R20C203.2, BTL 3,Applying,/ PO1 , PSO 1,2]**

10.Assume the following workload in a system. All jobs arrive at time 0 in the order given.

**Process Burst Time Priority**

P1 30 High

P2 28 High

P3 04 Low

P4 16 Medium

Draw a Gantt chart illustrating the execution of these jobs using Priority CPU scheduling algorithm and also Calculate the average waiting time and average turnaround time. **[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2]**

**11.** What is a Critical Section problem? Give the conditions that a solution to the critical section problem must satisfy.

**[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2]**

12.Explain about Inter Process Communication indetail?

**[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2]**

**UNIT-III**

1. a) What is paging? Explain the hardware support given for paging.

b) Consider the following page reference string 2,3,4,5,3,2,6,7,3,2,3,4,1,7,1,4,3,2,3,4,7. Calculate the number of page faults with LRU, FIFO and optimal page replacement algorithms with frame size of 3.

**[R20C203.3, BTL3, Applying, PO1, PSO 1,2]**

2. What is fragmentation? Explain the differences between internal and external fragmentation.

**[R20C203.3, BTL3, Applying, PO1, PSO 1,2 ]**

3. a) Explain about Swapping in detail?

b) Explain about Contiguous Memory Allocation with an example?

**[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

4. Explain the main function of the memory-management unit?

**[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

5.Distinguish between logical address and physical address?

**[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

6.Describe dynamic loading and dynamic linking?

**[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

7.Explain about LRU Page Replacement Algorithm?

**[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

8.Explain about Thrashing in detail? **[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

9.Explain about Demand paging with suitable examples?

**[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

10.Explain about kernel Memory allocation? **[R20C203.3, BTL3, Applying, PO 1, PSO 1,2]**

**Unit-IV**

1.Define the terms – file, file path, directory? **[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

2.Explain any four common file attributes? **[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

3.Explain any four file operations with an examples?

**[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

4.Define deadlock and Explain about Deadlock Recovery Algorithm ?

**[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

5.Define resource. List some resources that a process might need for its execution?

**[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

6.Explain the sequence in which a process may utilize the resources in normal mode of operation? **[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

7.Explain about Disk Structures & Disk Scheduling Algorithm with Suitable examples?

**[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

8.Explain about Critical Section problem – Dining Philosopher Problem, Reader-Writer Problem?

**[R20C203.4, BTL3, Applying, PO 1, PSO 1,2]**

**UNIT-V**

1.What criteria are important in choosing a file organization? & Explain briefly file system architecture & file management function. **[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

2.List& briefly explain 5 file organization. &Compare file organization methods.

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

3.Which are the typical information elements of a file directory? & Which are the typical operations performed on directory? **[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

4.What are the typical access rights that may be granted or denied to a particular user for a particular file? What are methods of free space management of Disk?

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

5.Explain linked list allocation using index in details. & Explain file system consistency in detail.

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

6.Explain file system reliability & performance in detail.

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

7.What is directory? Explain directory operation in details.

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

8.Explain linked list allocation of file in detail &Explain file system performance in detail.

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

9.Explain the following techniques to improve file system performance. a) block read ahead and b) Reducing disk arm motion **[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

10.Explain file system implementation using linked list with index and i-node in detail?

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

11.Explain the following file allocation methods a) Contiguous allocation b) i-node & What are points to be consider in file system design? Explain linked list allocation & index allocation in detail. **[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**

12.Differentiate between windows and unix file system.

**[R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2]**