**DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY**

Department of Computer Science &Engineering

**Scheme for Day-to-Day Assessments**

Name of the Program : B.Tech in Computer Science & Engineering Academic Year: 2022-23

Year & Semester: II Year I Semester Section: B No of Credits : 03

Name of the Course: Operating Systems Code : R20C203

Course: Core Regulation : R20

Course Area/Module: No of students registered: 69

Name of the Faculty : Mr. K. SRIKANTH Designation: Asst. Professor

**Assessment No: 01**

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

**[BTL2,Understanding, PO1, 2, 3, 4, 12/PSO 1,2 --- 10M]**

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

**[BTL2,Understanding,PO1, 2, 3, 4, 12/PSO 1,2 --- 10M]**

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

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1,2 --- 10M]**

**Scheme of Evaluation**

1. Diagram of Operating System Services - 3M

Explanation of Services - 7M

2. Definition of System calls - 2 M

Difference between System calls & Function - 2 M

Explanation About Categories of System calls -6 M

3. Diagram of Operating System Structure -3M

Explanation of Operating System Structure - 7M

**Set 2**

1. 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, PO1, 2, 3, 4, 12/PSO 1,2 --- 10M]**
2. Explain about Storage management with neat diagram?[**BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**
3. List out Operating system Operations in detail?

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

**Scheme of Evaluation**

**1.** Define the essential properties of the following types of operating systems:

(i) Batch -1 M

(ii) Interactive ( iii) Time sharing - 2+ 2 =4 M

(iv) Real time (v) Parallel - 2 + 1 =3 M

(vi) Distributed - 2 M

2. Diagram of Storage Management -3M

Explanation of Storage Management - 7M

3. Operations of Operating Systems -10 M

**Set 3**

1. Explain about Operating system Services in detail?

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1,2 --- 10M]**

1. Explain about any 3 computing Environments in detail?

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

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

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

**Scheme of Evaluation**

1. Diagram of Operating System Services - 3M

Explanation of Services - 7M

**2.**List of 3 Computing Environments - 2 M

Explanation of 3 Computing Environments - 8M

3. Definition of System calls - 2 M

Explanation About Categories of System calls - 8 M

**Set 4**

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

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

1. Explain about Open source operating systems in detail?.

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

1. Define Operating system structure with neat diagrams.

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

**Scheme of Evaluation**

1.Definition of Operating System -2 M

Explanation of Different Operating Systems - 8 M

2. Definition of Open source operating systems - 2 M

Explanation of different Open source operating systems -8 M

3. Diagram of Operating System Structure -3M

Explanation of Operating System Structure - 7M

**Remedial**

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

**[BTL2,Understanding, PO1, 2, 3, 4, 12/PSO 1,2 --- 10M]**

1. Explain about Storage management with neat diagram?

[**BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

3. Define Operating system structure with neat diagrams.

**[BTL2, Understanding, PO1, 2, 3, 4, 12/PSO 1, 2 --- 10M]**

**Scheme of Evaluation**

1. Diagram of Operating System Services - 3M

Explanation of Services - 7M

2. Diagram of Storage Management -3M

Explanation of Storage Management - 7M

3. Diagram of Operating System Structure -3M

Explanation of Operating System Structure - 7M

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Name of the Course: Operating Systems Code : R20C203

Course: Core Regulation : R20

Course Area/Module: No of students registered: 69

Name of the Faculty : Mrs. M.Manjula Designation: Asst. Professor

**Assessment No: 02**

**Class Test -2**

**Set-1**

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

**[R20C203.2, BTL 3,Applying,PO1 , PSO 1,2-- 10M]**

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

**[R20C203.2, BTL 3,Applying,PO1 , PSO 1,2-- 10M]**

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-- 10M]**

**Scheme of Evaluation**

1. What is critical section problem -4 M

Explanation of Peterson’s solution -6 M

2. Definition of Deadlock -2 M

Explanation of Deadlock prevention conditions -8 M

3. Explanation of SJF scheduling - 3 M

Gantt chart - 4 M

Calculate average waiting time - 3 M

**Set-2**

1. a)Explain the usage and structure of Semaphores with an example.

b) Define short-term, medium-term, and long-term scheduling.

**[R20C203.2, BTL 3,Applying, PO1 , PSO 1,2-- 5+5M]**

2 Explain different process states with neat sketch.

b) Explain how multiprogramming increases the utilization of CPU?

**[R20C203.2, BTL 3,Applying /PO1 , PSO 1,2-- 5+5M]**

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

**[R20C203.2, BTL 3,Applying /PO1 , PSO 1,2-- 10M]**

**Scheme of Evaluation**

1. Definition of Semaphores - 2M

usage and structure of Semaphores - 3 M

Semaphores example. - 5 M

2)a) Process State Diagram -2M

Explanation of Process States -3 M

b) Definition of multiprogramming -2 M

Expalnation of Utilization of CPU by using Multiprogramming -3 M

3.Definition of Scheduling -2 M

Explanation of Round Robin scheduling algorithm - 3 M

Example of Round Robin scheduling algorithm - 5 M

**Set-3**

1. 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-- 5+5M]**

2.Explain about Priority Scheduling algorithm with an Example?

**[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2-- 10M]**

3.a) Define process and Process Control Block ?

b)Explain about Process Synchronization in detail?

**[R20C203.2, BTL 3,Applying,/ PO1 , PSO 1,2-- 5+5M]**

**Scheme of Evaluation**

1. a) Definition of Deadlock -2 M

Explanation with an example - 3M

b) Explanation of Scheduling Criteria -2 M

i) CPU utilization and response time, ii) Average turnaround time and maximum waiting time, and iii) I/O device utilization and CPU utilization -3 M

2.Definition of Scheduling -2 M

Explanation of Priority scheduling algorithm - 3 M

Example of Priority scheduling algorithm - 5 M

3. Definition of Process -1 M

Diagram of PCB - 2M

Explanation of PCB -2 M

**Set-4**

.1. 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-- 10M]**

**2.** 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-- 10M]**

3.Explain about Inter Process Communication indetail?

. **[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2-- 10M]**

**Scheme of Evaluation**

1.Explanation of Priority scheduling - 3 M

Gantt chart - 4 M

Calculate average waiting time &Turnaround time - 3 M

**2.** What is critical section problem -4 M

Solution to Critical Section Problem -6 M

3. Definition of IPC - 2 M

Explain Different methods in IPC -8 M

**Remedial**

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

**[R20C203.2, BTL 3,Applying,PO1 , PSO 1,2-- 10M]**

2 Explain different process states with neat sketch.

b) Explain how multiprogramming increases the utilization of CPU?

**[R20C203.2, BTL 3,Applying /PO1 , PSO 1,2-- 5+5M]**

3.Explain about Inter Process Communication indetail?

. **[R20C203.2, BTL 3,Applying, /PO1 , PSO 1,2-- 10M]**

**Scheme of Evaluation**

1. What is critical section problem -4 M

Explanation of Peterson’s solution -6 M

2)a) Process State Diagram -2M

Explanation of Process States -3 M

b) Definition of multiprogramming -2 M

Expalnation of Utilization of CPU by using Multiprogramming -3 M

3. Definition of IPC - 2 M

Explain Different methods in IPC -8 M

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Name of the Faculty : Mrs.N.Madhuri Designation: Asst. Professor

**Assessment No: 03**

**Class Test -3**

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 -- 10M]**

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

**[R20C203.3, BTL3, Applying, PO1, PSO 1,2 -- 10M]**

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 -- 10M]**

**Scheme of Evaluation**

1. Definitionpaging -1 M

Diagram of Paging - 2 M

Explanation of the hardware support for paging - 7 M

2. Definition of fragmentation -2 M

Differences Between Internal and external fragmentation - 8 M

3. a) Definition of Swapping -2 M

Explanation of Swapping in detail - 3M

b) Explanation of Contiguous Memory Allocation - 3 M

Contiguous Memory Allocation Example - 2M

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Name of the Faculty : Mrs. M. Manjula Designation: Asst. Professor

**Assessment No: 04**

**Class Test -4**

1. Explain about LRU page replacement algorithms with an Example?

**[R20C203.3, BTL 3,Applying, PO1 , PSO 1,2-- 5+5M]**

2 . How does the system detect Thrashing ? What can the system do to eliminate this Problem?

**[R20C203.3, BTL 3,Applying /PO1 , PSO 1,2-- 10 M]**

3. What is Demand Paging ? Explain the Performance of Demand Paging ?

**[R20C203.3, BTL 3,Applying /PO1 , PSO 1,2-- 10M]**

**Scheme of Evaluation**

1. Solution for LRU Page Replacement algorithm and Example - 5+ 5 M

2. Definition of Thrashing - 2M

Detect & Eliminate the Problem of Thrashing - 3+ 5 M

3. Definition of Demand Paging -3 M

Performance of Demand paging in detail - 7 M

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Name of the Faculty : Mrs.N.Madhuri Designation: Asst. Professor

**Assessment No: 05**

**Class Test -5**

1) In detail explain the structure of disk with a neat diagram. How to attach to the

existing memory resource? **[R20C203.4, BTL3, Applying,PSO 1,2 -- 10M]**

2) a) Explain different File Attributes and File Operations. [5M + 5M]

b) Discuss different RAID structures.  **[R20C203.4, BTL3, Applying,PSO 1,2 -- 10M]**

3) a) What is a deadlock? Explain the necessary condition for deadlock. [5M+5M]

b) Explain the following deadlock avoidance algorithms:

i) Banker’s algorithm ii) Safety algorithm.**[ R20C203.4, BTL3,Applying,PSO 1,2 -- 10M]**

**Scheme of Evaluation**

1.Srtruture of Disk Diagram -2M

Explanation -8 M

2.a) File Attributes and File Operations (2 + 3 M)

b) RAID Structure Explanation - 5 M

3. Definition of Deadlock -2M

Necessary Conditions of Dead Lock -3 M

Bankers Algorithm - 3 M Safety Algorithm -2 M

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Name of the Faculty : Mrs.N.Madhuri Designation: Asst. Professor

**Assessment No: 06**

**Classtest-06**

1. What is meant by Access Matrix? Explain in detail about Access Matrix?

**[ R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2 -- 10M]**

1. Explain about Different types of Threats in detail?

**[ R20C203.5, BTL4, Analyzing, PO 2, PSO 1,2 -- 10M]**

1. Explain about Cryptography and Discuss about Different tools for authentication?

**[ R20C203.5, BTL4, Analyzing, PO2, PSO 1,2 -- 10M]**

**Scheme of Evaluation**

1.Definition of Access Matrix - 2M

Explanation of Access Matrix - 8 M

2. Definition of Threats - 2 M

Explanation of Different Types of Threats - 8 M

3. Cryptography Definition - 2M

Explanation about Different tools for authentication - 8 M