Enroll. No._____

MARWADI UNIVERSITY
MU-FOT
CE-FOT1 (MU)
Semester 4 - Winter

**Subject : OPERATING SYSTEM ( 01CE0401 )**
**Date : 16-Nov-2021** **Time : 3 Hours** **Total Marks : 100**

**Instructions :**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

**Que.1 Answer the following objectives** **[10]**
**(A)**

(1) Semaphore is a/an _____ to solve the critical section problem.
a) hardware for a system
b) integer variable
c) special program for a system
d) None of these

(2) Which one of the following is a visual(mathematical) way to determine the deadlock occurrence?
a) resource allocation graph
b) starvation graph
c) inversion graph
d) none of the mentioned

(3) The code that changes the value of the semaphore is:
a) Remainder section code
b) Non – critical section code
c) Critical section code
d) None of these

(4) If the quantum time of round robin algorithm is very large, then it is equivalent to:
a) First in first out
b) Shortest Job Next
c) Lottery scheduling
d) None of the above

(5) The ……. policy is very simple to implement but performs relatively poorly.
a) FIFO
b) OPTIMAL
c) Clock
d) LRU

(6) Which buffer holds the output for a device?
a) spool
b) output
c) status
d) magic

(7) TLB is defined as:

a) Translation Look Aside buffer
b) Translation Look Ahead Buffer
c) Translation Look aside Bucket
d) Translation Look around buffer

(8) WFG is called as
a) weight for graph
b) wait for graph
c) wait forming graph
d) both b and C

(9)
Which one of the following is the deadlock avoidance algorithm?
A. banker's algorithm
B. round-robin algorithm
C. elevator algorithm
D. karn's algorithm

(10) Compaction is defined as :
a) A technique for overcoming internal fragmentation
b) A paging technique
c) A technique for overcoming external fragmentation
d) A technique for overcoming fatal errors

**Que.1 (B) Answer the following questions.** **[10]**

(1) State the four conditions, which must occur to have deadlock in the system.

(2) Need Matrix

(3) deadlock

(4) Define Critical section.

(5) resource allocation graph

(6) List any five name of OS

(7) mutual exclusion

(8) If the resources are always preempted from the same process, _____ can occur.

(9) Define application Software

(10) Explain Circular wait a necessary condition that leads to Deadlock.

**Que.2**

(A) Compare and Explain different levels of RAID. [8]

(B) Discuss with diagram cryptoghraphy as a security tool [8]

OR

(B) Explain segmentation and discuss its advantages over paging. [8]

**Que.3**

(A) Compute Average Turn Around Time (TAT) and Average Waiting Time (AWT) using priority- non-preemptive scheduling method on data given below.[ consider 1 = highest priority] [8]

| Process ID | Priority | Burst Time |
|---|---|---|
| 1 | 3 | 10 |
| 2 | 1 | 1 |
| 3 | 4 | 2 |
| 4 | 5 | 1 |
| 5 | 2 | 5 |

(B) Explain goals of i/o software. [4]

(C) What are the major process attributes? Explain in brief. [4]

OR

(A) Explain Producer Consumer Problem using Semaphore with the help of suitable code. [8]

(B) What do you mean by scheduler? Explain its types in brief. [4]

(C) Explain Segment Table. [4]

**Que.4**

(A) Enlist the services of OS and explain any 4 of them [8]

(B) Given a physical memory with two frames, how many page faults would occur while processing the following reference string of pages using FIFO and Optimal page replacement algorithms. Also, show which pages would be present in the memory after the completion of reference string. [8]

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

Remember all frames are initially empty, so your first unique pages will all cost one fault each.

OR

(A) Why we need OS. Enlist types of OS. Explain any two/three types in brief. [8]

(B) Write a short note on worst -fit, best-fit, first-fit, and next-fit strategies for disk space allocation with their merits and demerits. [8]

**Que.5**

(A) Compute Average Turn Around Time (TAT) and Average Waiting Time (AWT) using Round Robin by taking TQ =3 scheduling method on data given below. [6]

| Process ID | Arrival Time | Burst Time |
|---|---|---|
| 1 | 5 | 5 |
| 2 | 4 | 6 |
| 3 | 3 | 7 |
| 4 | 1 | 9 |
| 5 | 2 | 2 |
| 6 | 6 | 3 |

(B) Elaborate: 1. Worms 2. Virus [6]

(C) With the help of a suitable code illustrate the Peterson's solution to the process synchronization. [4]

OR

(A) Explain mutual exclusion and any two solutions to achieve it. [6]

(B) Given a physical memory with three frames, how many page faults would occur while processing the following reference string of pages using Least recently used (LRU) and Optimal page replacement algorithms. Also, show which pages would be present in the memory after the completion of reference string. [6]

*1, 2, 3, 2, 1, 5, 2, 1, 6, 2, 5, 6, 3, 1, 3, 6, 1, 2, 4, 3*

Remember all frames are initially empty, so your first unique pages will all cost one fault each.

(C) What so you mean by file? Explain various extension to represent file name. [4]

**Que.6**

(A) What are the need of thread? Differentiate process and thread. [8]

(B) Explain Hierarchal / Multilevel Paging. [4]

(C) What is a page and what is a frame. How are the two related? [4]

OR

(A) Explain Banker's algorithm for multiple resource with example and figure [8]

(B) Explain Demand Paging along with the concept of valid and invalid bit. [4]

(C) Differentiate: Semaphore and Monitors. [4]

*---Best of Luck---*

**MARWADI UNIVERSITY**
**MU-FOT**
**CE-FOT1 (MU)**
**Semester 4 - Winter**

---

**Subject : OPERATING SYSTEM ( 01CE0401 )**
**Date : 16-Nov-2021** **Time : 3 Hours** **Total Marks : 100**

| Difficulty Level | Weightage | | No of Question | Total Marks | Question List |
|---|---|---|---|---|---|
| | Recommended | Actual | | | |
| High | 20 | 23.26 | 10 | 40 | 1(A), 1(B), 2(A), 3(B), 4(A), 5(C), 6(A), 6(B) |
| Low | 20 | 27.91 | 18 | 48 | 1(A), 1(B), 4(B), 5(A), 5(B), 5(C), 6(C) |
| Medium | 60 | 48.84 | 17 | 84 | 1(A), 1(B), 2(B), 3(A), 3(B), 3(C), 4(A), 5(A), 5(B), 6(A), 6(B), 6(C) |

---

| Module Name | Weightage | | No of Question | Total Marks | Question List |
|---|---|---|---|---|---|
| | Recommended | Actual | | | |
| Lab2 | 1 | 0.00 | 0 | 0 | |
| Lab3 | 1 | 0.00 | 0 | 0 | |
| Lab4 | 1 | 0.00 | 0 | 0 | |
| Lab5 | 1 | 0.00 | 0 | 0 | |
| Lab6 | 1 | 0.00 | 0 | 0 | |
| Lab7 | 1 | 0.00 | 0 | 0 | |
| Lab8 | 1 | 0.00 | 0 | 0 | |
| Lab9 | 1 | 0.00 | 0 | 0 | |
| Lab10 | 1 | 0.00 | 0 | 0 | |
| Lab11 | 1 | 0.00 | 0 | 0 | |
| Lab12 | 2 | 0.00 | 0 | 0 | |
| Lab13 | 2 | 0.00 | 0 | 0 | |
| Operating Systems | 5 | 10.47 | 4 | 18 | 1(B), 4(A) |
| Protection & Security | 5 | 8.14 | 2 | 14 | 2(B), 5(B) |
| Lab1 | 5 | 0.00 | 0 | 0 | |
| File system Interface | 8 | 2.33 | 1 | 4 | 5(C) |
| Mass-storage structure & I/O systems | 8 | 7.56 | 3 | 13 | 1(A), 2(A), 3(B) |
| Process and Threads | 10 | 18.02 | 6 | 31 | 1(A), 3(A), 3(B), 3(C), 5(A), 6(A) |
| Principles of deadlock | 10 | 10.47 | 11 | 18 | 1(A), 1(B), 6(A) |
| Concurrency Control (IPC) | 15 | 14.53 | 7 | 25 | 1(A), 1(B), 3(A), 5(A), 5(C), 6(C) |
| Memory Management | 20 | 28.49 | 11 | 49 | 1(A), 2(B), 3(C), 4(B), 5(B), 6(B), 6(C) |

---

| Blooms Taxonomy | Weightage | | No of Question | Total Marks | Question List |
|---|---|---|---|---|---|
| | Recommended | Actual | | | |
| Remember / Knowledge | 20 | 19.77 | 21 | 34 | 1(A), 1(B), 4(B), 6(C) |
| Understand | 30 | 29.65 | 11 | 51 | 1(B), 3(B), 3(C), 4(A), 5(A), 5(C), 6(B) |
| Apply | 25 | 20.93 | 5 | 36 | 3(A), 4(B), 5(A), 5(B) |
| Analyze | 15 | 16.86 | 5 | 29 | 1(A), 2(A), 2(B), 5(C), 6(A) |

| Blooms Taxonomy | Weightage | | No of Question | Total Marks | Question List |
|---|---|---|---|---|---|
| | Recommended | Actual | | | |
| Evaluate | 10 | 4.65 | 1 | 8 | 6(A) |
| Higher order Thinking | 0 | 8.14 | 2 | 14 | 2(B), 5(B) |