WALCHAND COLLEGE OF ENGINEERING
(Government Aided Autonomous Institute)
Visharambag, Sangli – 416415
Second Year B.Tech. Computer Science and Engineering
Re-Exam, EVEN SEMESTER, AY 2022-23
Operating Systems (6CS222)

Re-Exam

PRN: _____

Day & Date: Tuesday, 12/09/2023   Time : 02.00 pm to 05.00 pm

Max Marks: **100**

IMP: Verify that you have received question papers with correct course code, branch etc.

Instructions
a) All questions are compulsory.
b) Writing question number on answer book is compulsory otherwise answers may not be assessed.
c) Assume suitable data wherever necessary.
d) Figures to the right of question text indicate full marks.
e) Mobile phones, smart gadgets and programmable calculators are strictly prohibited.
f) Except PRN anything else writing on question paper is not allowed.
g) Exchange/Sharing of stationery, calculator etc. not allowed.

Text on the right of marks indicates course outcomes (Only for faculty use)

		Marks	
Q1	**A)** Draw Computer System **Structure** & explain the four components usage. What do you mean by kernel?	6	CO1
	B) Which various **services** are provided by operating system for users? Enlist and discuss the importance for the sake of users.	6	CO1
	C) Explain why the **system calls** are used in OS design? Mention types of system calls implemented by OS with details of each with examples for Windows/Unix.	6	CO2
Q2	**A)** Write short note on the following System Programs **Assembler Compiler Loader Linker**	6	CO1
	B) Explain a **two-pass assembler**. Also brief on why two passes are required in this scheme.	6	CO2
	C) What do you mean by **Software Tools**? Mention these tools with their purpose. Also brief on the type of **Editors**.	6	CO1
Q3	**A)** Enlist the different *states* which are associated with a process. Draw the Process **State transition diagram** and explain their state transition details.	6	CO3
	B) Discuss the Long-term, Short-term and Medium-term **schedulers** which are used in process scheduling? Brief on each schedulers working with process scheduling representation diagram.	6	CO2

C) Implement **Shortest Job First** Scheduling algorithm and calculate average waiting time. Draw Gantt chart to illustrate.

Processes	CPU burst time (ms)
P1	6
P2	8
P3	7
P4	3

6

Q4 A) What is **Race condition** in process synchronization? What do you mean by **Critical-Section problem**? Write steps of the **Peterson's** algorithm for two cooperating processes solution.

6

B) Explain **Bounded-Buffer** Problem as **classical** problems of synchronisation. What is use **semaphore** in process synchronization?

6

C) With the help of Bridge-crossing example explain the **Deadlock** problem in process synchronization. Also briefly mention on the methods for deadlock **prevention** & deadlock **avoidance**.

6

Q5 A) What is **Swapping** technique used in memory management allocation methods with its schematic view? Also note on internal & external **fragmentation** problem with suitable example.

6

B) Write short note on the following concepts,

Paging   Segmentation   **Virtual Memory**

6

C) For given Page reference string 6 2 1 2 3 7 6 3 2 1 2 3 6 illustrate how many Page Fault and Page Hit would occur using **FIFO and LRU Page Replacement** Virtual memory management algorithm assuming 3 frames available.

6

Q6 A) Discuss on File attributes, File operations, File types, File access methods concepts of **File management**. Also brief on in-memory File system structures and a typical File control block used in **File implementation**.

5

B) To protect a system which four level security measures are essential? Also write note on program, system and network security threats

5

····· *End of question paper* ·····