WALCHAND COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Vishrambag, Sangli – 416415

Second Year B.Tech. Computer Science and Engineering
ESE , EVEN SEMESTER, AY 2023-24
Operating Systems (6CS222)

ESE

PRN: _____

Day & Date: Thursday, 16/05/2024 Time : 3.00 pm to 5.00 pm Max Marks: **50**

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)	Which **System goals** and **User goals** are considered while designing an Operating System? Discuss **Layered OS** structure with diagram and its associated benefits.	5	CO1
	B)	What is the typical **sequence** of System Softwares in the execution of any program? Enlist and brief about which System **Software Tools** are required for program development.	5	CO1
Q2	A)	In Process scheduling which are the benefits of '**Multilevel-feedback-queue scheduler**'. Design such a Multilevel-feedback-queue scheduler with 3 queues and following details, Q_0 – RR with time quantum 6 milliseconds Q_1 – RR time quantum 14 milliseconds Q_2 – FCFS Draw and briefly explain working of this scheduler.	5	CO3
	B)	Which are the **classical problems** of Process Synchronization? Enlist them and briefly discuss **any of them** with suitable example.	5	CO2
Q3	A)	What is the **Critical-section problem** encountered in process synchronization? Which software based solutions are used to fulfill the three conditions that must be fulfilled to solve this problem? Elaborate on this with details of any such **algorithm**.	5	CO2
	B)	With suitable example explain the **deadlock problem.** When deadlock can arise (characterizations)? Also discuss the **Bankers algorithm** with its working.	5	CO3

Q4	**A)**	In memory management which **problem** occurs with contiguous allocation technique? Brief on it. Also with neat diagram elaborate on **Paging** technique with **TLB** (Cache/Associative memory) used in Memory management.		5
	B)	Write note on any two of the following, **Segmentation** **Virtual Memory** **Thrashing**		5
Q5	**A)**	Illustrate total Page-faults and Page-hits for the given reference string 4 3 2 1 4 3 5 4 3 2 1 5 for **three** frames per process using FIFO, Optimal and LRU algorithms respectively of **Page Replacement** techniques.		5
	B)	Describe how **files are managed** by OS in terms of file attributes, operations, accessing methods with suitable examples. Also brief on directory **organization** and draw the tree directory structure.		5

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