WALCHAND COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

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Second Year B.Tech. (Computer Science and Engineering)
END SEMESTER EXAMINATION (EVEN SEM AY 2021-22) JUN. - 2022
Operating Systems (5CS223)

ESE

Day, Date and Time: Wednesday, 08/06/2022, 02.00PM to 04.00PM

PRN: _____

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

Max Marks: 60

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 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 the view of Operating System Services environment for execution of programs to programs and users. Also brief those services.		5	CO1
Q1 B)	Discuss the role of Complier, Assembler, Linker and Loader System Programs for execution of a program in general.		5	CO2

Q2 A) Implement Round Robin Scheduling algorithm and Calculate response time, waiting time of following each processes and average waiting time for time quantum of 2 ms. **5 CO3**

Processes	CPU burst time (ms)
P1	10
P2	1
P3	2
P4	1
P5	5

Q2 B) With the help of Peterson's algorithm describe the Critical-section problem. Also brief on the three conditions that must be fulfilled in providing the solution to solve this problem. **5 CO3**

Q3 A) Which are the classical problems of Process Synchronization? Enlist them and briefly discuss any of them with suitable example. **5 CO2**

Q3 B) Suppose there are two processes P1 and P2 and two resources R1 and R2: P1 holds R1 and waiting for resource R2. Whereas P2 holds R2 and waiting for resource R1. Apply four necessary conditions of deadlock for above system and describe state of system. **5 CO2**

Q4 A) Consider the following Resource-Allocation Graph and: **5 CO2**
i) illustrate graph.
ii) verify for Deadlock detection.
iii) convert into wait-for graph

Q4 B) What are the difficulties in using contiguous memory while allocating main memory to different processes? Discuss external and internal fragmentation issue with solution. **5 CO2**
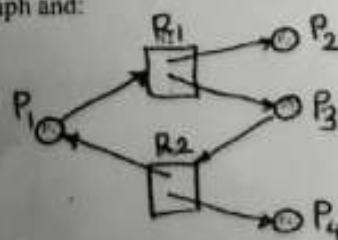
Q5 A) With the help of diagram explain Implementation of Page table used in Paging scheme indicating logical and physical memory. Also differentiate between Paging and Segmentation of main memory techniques.   5

Q5 B) What is Demand Paging scheme used in virtual memory? Schematically mention the steps in Handling a Page Fault.   5

Q6 A) Find total Page-faults and Page-hits for the given reference string 3 2 1 3 4 1 6 2 4 3 4 2 1 4 5 2 1 3 4 for three frames per process using FIFO, Optimal and LRU algorithms respectively of Page Replacement techniques.   5

Q6 B) Write a note on the following concepts of File management with suitable examples.   5
File attributes   File operations   File types   File access methods