# Vivekananda College of Engineering & Technology, Puttur
[A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]
Affiliated to VTU, Belagavi & Approved by AICTE New Delhi

| CRM08 | Rev 1.10 | CSE | 29/07/2022 |
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## CONTINUOUS INTERNAL EVALUATION – 2

| Dept:CSE | Sem / Div:4th CSE | Sub:Operating Systems | SCode:18CS43 |
|---|---|---|---|
| Date:04/8/22 | Time: 9:30-11:00 | Max Marks: 50 | Elective:N |

Note: Answer any 2 full questions, choosing one full question from each part.

| QN | Questions | Marks | RBT | CO's |
|---|---|---|---|---|
| | **PART A** | | | |
| 1 a | Define Paging. Explain paging hardware with a neat diagram. | 10 | L2 | CO2 |
| b | 1. Assume that there are 5 processes P0 through P4 and 4 types of resources. At time $T_0$ we have the following state: | 10 | L2 | CO2 |

| Process | Allocation | | | | Max | | | | Available | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | A | B | C | D | A | B | C | D |
| P0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 5 | 2 | 0 |
| P1 | 1 | 0 | 0 | 0 | 1 | 7 | 5 | 0 | | | | |
| P2 | 1 | 3 | 5 | 4 | 2 | 3 | 5 | 6 | | | | |
| P3 | 0 | 6 | 3 | 2 | 0 | 6 | 5 | 2 | | | | |
| P4 | 0 | 0 | 1 | 4 | 0 | 6 | 5 | 6 | | | | |

Apply Banker's Algorithm to answer the following:
i) What is the content of need matrix?
ii) Is the system in a safe state?
iii) If a request from a process P1(0,4,2,0) arrives, can it be granted?

| c | What is deadlock? Explain the Necessary Conditions For deadlock. | 5 | L2 | CO2 |
|---|---|---|---|---|
| | **OR** | | | |
| 2 a | What is segmentation. Explain with a neat diagram and example. | 10 | L2 | CO2 |
| b | | 10 | L2 | CO2 |

| Process | Allocation | | | Max | | | Available | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C |
| P0 | 0 | 0 | 2 | 0 | 0 | 4 | 1 | 0 | 2 |
| P1 | 1 | 0 | 0 | 2 | 0 | 1 | | | |
| P2 | 1 | 3 | 5 | 1 | 3 | 7 | | | |
| P3 | 6 | 3 | 2 | 8 | 4 | 2 | | | |
| P4 | 1 | 4 | 3 | 1 | 5 | 7 | | | |

Find the need matrix and calculate safe sequence using Banker's algorithm. Mention the above system is safe or not safe. If a request from process P2 arrives for (0,0,2), can the request be granted immediately?

| | | | | | |
|---|---|---|---|---|---|
| c | What is fragmentation. Explain its types. | | 5 | L2 | CO2 |

## PART B

| | | | | | |
|---|---|---|---|---|---|
| 3 | a | With a neat sketch explain structure of page table.(all types) | 10 | L2 | CO3 |

| b | | | | | |
|---|---|---|---|---|---|

| Process | Allocation | | | Max | | | Available | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C |
| | | | | | | | 3 | 3 | 2 |
| P0 | 0 | 1 | 0 | 7 | 5 | 3 | | | |
| P1 | 2 | 0 | 0 | 3 | 2 | 2 | | | |
| P2 | 3 | 0 | 2 | 9 | 0 | 2 | | | |
| P3 | 2 | 1 | 1 | 2 | 2 | 2 | | | |
| P4 | 0 | 0 | 2 | 4 | 3 | 3 | | | |

Answer the following questions using banker's algorithm.
i) What is the content of the matrix need?
ii) Is the system in a safe state?
iii) If a request from process P1 arrives for (1, 0, 2) can the request be granted immediately?

| | | | 10 | L2 | CO3 |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| c | Example: Given the memory partitions of 200K, 700K, 500K, 300K, 100K, and 400K. Apply first fit ,best fit and the worst fit algorithms to place processes with 315K, 427K, 250K, and 550K size. | | 5 | L2 | CO3 |

## OR

| | | | | | |
|---|---|---|---|---|---|
| 4 | a | With a neat diagram explain Copy-on-write, Swapping and TLB. | 10 | L2 | CO3 |
| | b | What is page fault? With a neat diagram explain steps in handling page fault. | 10 | L2 | CO3 |
| | c | On a system using simple segmentation, compute the physical addresses for each of the logical address, logical address is given in the following segment table. If the address generates a segment fault, indicate it as "segment fault". | 5 | L2 | CO3 |

| Segment | Base | Length |
|---|---|---|
| 0 | 330 | 124 |
| 1 | 876 | 211 |
| 2 | 111 | 99 |
| 3 | 498 | 302 |

i) 0,99
ii) 2,78
iii) 1,265
iv) 3,222
v) 0,111

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HOD