



**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF INFORMATION SCIENCE  
END TERM EXAMINATION - JAN 2023**

**Semester :** Semester III - 2021

**Date :** 10-JAN-2023

**Course Code :** CSA1006

**Time :** 9.30AM - 12.30PM

**Course Name :** Sem III - CSA1006 - Operating Systems and Unix Programming

**Max Marks :** 100

**Program :** BCA / BCV / BCG / B.Sc-Data Science

**Weightage :** 50%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.

**PART A**

**ANSWER ALL THE FOLLOWING QUESTIONS**

**10 X 2 = 20M**

1. What is the main advantage of multiprogramming? (CO1) [Knowledge]
2. What is dispatch latency? (CO1) [Knowledge]
3. Define busy waiting and spinlock. (CO2) [Knowledge]
4. Define deadlock avoidance. (CO2) [Knowledge]
5. Define swapping. (CO3) [Knowledge]
6. Consider a single level paging scheme with a TLB. Assume no page fault occurs. It takes 20 ns to search the TLB and 100 ns to access the physical memory. If TLB hit ratio is 80%, the effective memory access time in msec. (CO3) [Knowledge]
7. What are the various page replacement algorithms used for page replacement? (CO3) [Knowledge]
8. Define entry section and exit section. (CO2) [Knowledge]
9. What are the various disk-scheduling algorithms? (CO4) [Knowledge]
10. What are the different attributes of file? (CO4) [Knowledge]

**PART B**

**ANSWER ALL THE FOLLOWING QUESTIONS**

**5 X 10 = 50M**

11. What is Process control block? Explain the contents of PCB? (CO1) [Comprehension]
12. What is semaphore and what are its types? (CO2) [Comprehension]

13. Consider a three process in a system which may request any of 12 drives. the current allocation state given below. Show that the allocation state is unsafe. Will this system lead to deadlock state?

	Allocation	Max Need	Available
P0	5	10	12
P1	2	4	
P2	3	9	

(CO2) [Comprehension]

14. What is swapping? what are its advantages and disadvantages. (CO3) [Comprehension]

15. Consider a single level paging scheme. The virtual address space is 4 GB and page size is 128 KB. What is the maximum page table entry size possible such that the entire page table fits well in one page?

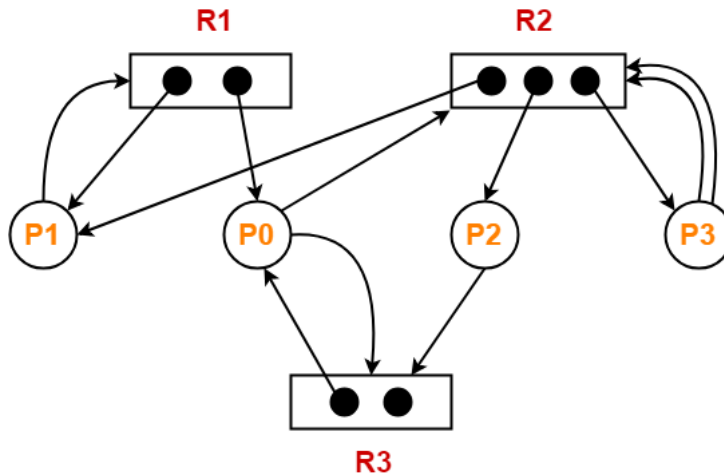
(CO3) [Comprehension]

### PART C

ANSWER ALL THE FOLLOWING QUESTIONS

2 X 15 = 30M

16. Consider the resource allocation graph in the figure-



Find if the system is in a deadlock state otherwise find a safe sequence.

(CO2) [Application]

17. What is Segmentation? list its advantages and disadvantages. Consider the following segment table-

Segment No.	Base	Length
0	1219	700
1	2300	14
2	90	100
3	1327	580
4	1952	96

Which of the following logical address will produce trap addressing error? Calculate the physical address if no trap is produced.

- a. 0, 430
- b. 1, 11
- c. 2, 100
- d. 3, 425
- e. 4, 95

Calculate the physical address if no trap is produced.

(CO3) [Application]

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