

Vidya Vikas Mandal's  
Shree Damodar College of Commerce & Economics, Margao-Goa  
FY BCA Semester-II, Semester End Examination, April/May 2023  
Operating Systems Concepts (CAC-106)  
(Truncated Syllabus 2021-2022)

Duration: 2 Hours

Max Marks: 60

*Instructions: 1) Figures to the right indicate Full Marks.  
2) All Questions are compulsory.*

**Q.1A. State True or False for the following statements:** (5x1=05 marks)

- a) Bankers Algorithm is a deadlock avoidance method.
- b) In First Fit algorithm the smallest block that is big enough is allocated to the program.
- c) The operating system can rollback the system to the previous safe state.
- d) In Direct access method the information in the file is processed in order, one record after the other.
- e) Each platter is divided into heads.

**Q.1B. Define the following terms:** (5x1= 05 marks)

- a) PCB
- b) Peripheral Device
- c) Sector
- d) Circular wait
- e) Contiguous Memory Allocation

**Q.2. Answer the following:** 10 marks

- a) List any four process states. (2)
- b) Explain the Instruction cycle with a neat diagram. (3)
- c) Explain the relationship between kernel, OS and hardware (5)

**Q.3. Answer the following** 10 marks

- a) Discuss two level directory structure. (2)
- b) Give three points of difference between process and threads. (3)
- c) Consider the following table of arrival time and burst time for four processes P1, P2, P3, P4 and P5. The non pre-emptive Priority scheduling algorithm is used. Draw the Gantt chart and estimate the average waiting time. (5)

Process	Burst Time	Priority
P1	6	2
P2	12	4
P3	1	5
P4	3	1
P5	4	3

**Q.4. Answer the following**

**10 marks**

- a) Discuss Resource Allocation Graph (RAG). (2)
- b) Explain the critical section problem. (3)
- c) Assume there are three frames and consider the reference string below. (5)

Reference string: 3, 1, 2, 1, 6, 5, 1, 3

Apply Optimal Page replacement algorithm to show the content of memory after each page reference. Also, calculate the hit ratio and miss ratio. (5)

**Q.5. Answer the following**

**10 marks**

- a) What is swapping? (2)
- b) Discuss the two types of Fragmentation. (3)
- c) Explain Paging with the help of neat diagram. (5)

**Q.6. Answer the following**

**10 marks**

- a) What is demand paging? (2)
- b) Explain Deadlock with the help of an example. (3)
- c) Consider a disk queue with requests for I/O to blocks on cylinders 87, 160, 40, 140, 36, 66, 72, 15. The head is initially at cylinder number 60 moving towards larger cylinder numbers on its servicing pass. The cylinders are numbered from 0 to 180. Apply the SSTF disk scheduling algorithm and compute the total seek time. (5)

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