BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

Computer Science & Engineering

B. Tech. Sem - IV :SUMMER : 2023

SUBJECT : SYSTEM PROGRAMMING & OPERATING SYSTEM

Day : Saturday | Time : 10:00 AM-01:00 PM

Date : 27-05-2023 | S-25582-2023 | Max. Marks : 60

N. B.

1) All Questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHEREVER** necessary.
4) Assume suitable data if necessary.

Q. 1 Explain data structure and Algorithm required for pass-I assembler. What is forward reference? How it is handled in single pass assembler. **(10)**

OR

Explain in brief imperative statement, declarative statement and assembler directives with example for assembly language programming. Also differentiate between Literal and Immediate operand.

Q. 2 Explain working of LEX and YACC in detail. Write a LEX program to count number of vowels and consonants in a given string. **(10)**

OR

Explain in detail

1) compile and go loader
2) absolute loader

Q. 3 What is operating system? Explain in detail different types of OS. **(10)**

OR

Explain different types of scheduling algorithms with suitable example

Q. 4 Define deadlock. What are the necessary conditions for deadlock. Explain deadlock avoidance algorithm with suitable example. **(10)**

OR

Write a note on

a) Interprocess communication
b) Dining Philosopher problem

Q. 5 Explain swapping and virtual memory system with example **(10)**

OR

Consider the page string 2,3,2,1,5,2,4,5,3,2,5,2. Calculate page fault and hit ratio for : FIFO, LRU and OPT (Frame size =3)

Q. 6 Explain about RAID in detail **(10)**

OR

Write a note on

a) file allocation methods
b) file management under UNIX

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Computer Science & Engineering

B.Tech.Sem - IV :SUMMER : 2023

SUBJECT : SYSTEM PROGRAMMING & OPERATING SYSTEM

Day : Saturday

Time : 10:00 AM-01:00 PM

Date : 27-05-2023

S-24304-2023

Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw diagrams wherever necessary.
4) Use of Scientific Calculator is allowed

Q.1 a) Explain the data structures and algorithm for TWO PASS assembler in details. **(10)**

OR

Q.1 Write algorithm of Pass-I of two pass assembler. Define assembler directives. Explain ORIGIN, EQU and LTORG with examples. **(10)**

Q.2 What are types of loaders? Discuss different functions of loaders. Explain general loader scheme with advantages and disadvantages using suitable diagram. **(10)**

OR

Q.2 Draw a general model of compiler and explain all phases in brief. Consider input d= a+b*2 and show the output of each phase of compiler. **(10)**

Q.3 What are the types of schedulers? Explain theme with suitable diagram. **(10)**

OR

Q.3 Draw Gantt chart and calculate Avg. Turnaround time, Avg. waiting time for the following processes using, SJF (non-preemptive) scheduling and round robin with quantum 2 **(10)**

Process	Arrival Time	Burst Time
P1	0	6
P2	1	4
P3	4	8
P4	3	3

Q.4 Define deadlock. What are necessary condition for deadlock? Also explain deadlock avoidance algorithm with suitable example. **(10)**

OR

Q.4 Explain Banker's algorithm in detail. Find out the safe sequence for execution of 3 processes using Banker's algorithm maximum resources R1=7, R2= 7, & R3= 10 **(10)**

Allocation Matrix

	R1	R2	R3
P1	2	2	3
P2	2	0	3
P3	1	2	4

Maximum Requirement Matrix

	R1	R2	R3
P1	3	6	8
P2	4	3	3
P3	3	4	4

Q.5 List different page replacement policies and explain FIFO, LRU and Optimal in detail with example. **(10)**

OR

Q.5 Write short note on: **(10)**

i) Demand paging and its advantages.

ii) Thrashing in memory management.

Q.6 Explain in detail- **(10)**

i) RAID

ii) Types of File Organization.

OR

Q.6 Discuss in detail about file allocation methods. What are the possible structures for directory? Discuss them in detail. **(10)**

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