Total No. of Questions : 12]

SEAT No. :

P2348

[Total No. of Pages : 4

[4758]-86

T.E. (Computer Engg.)

SYSTEM PROGRAMMING & OPERATING SYSTEMS

(2008 Course) (Semester - II) (310252)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) What features of assembly language makes it mandatory to design a two pass assembler? Explain with example. **[6]**

b) What is forward reference? How it is handled in a single pass assembler? **[6]**

c) Give format of different databases that are used for design of PASS -I of two pass assembler. **[6]**

OR

Q2) a) In an assembly language program, certain action is required at 'n' places in the program. Under what condition would you code this action as macro or subroutine. **[8]**

b) Draw a flow chart for pass-I of two pass assembler design & explain. **[10]**

Q3) a) What is loader? What are it's basic functions. **[6]**

b) Write a note on MS-DOS linker. **[6]**

c) Explain the difference between .EXE and .DLL files. **[4]**

OR

P.T.O.

Q4) a) What are the databases required for design of direct link loader? Give their formats. **[8]**

b) Draw flow chart for pass-I of two pass direct linking loader. **[8]**

Q5) a) Write short note on: **[10]**

i) Distributed operating system.

ii) Multiprogramming.

iii) Real time scheduling.

iv) Library functions

v) System calls.

b) Define the essential properties of the following operating system **[6]**

i) Batch

ii) Time sharing

iii) Real time.

OR

Q6) a) Comment on: A program and process are two different concepts. **[6]**

b) Consider the following set of processes, with the length of the CPU burst time given in milliseconds: **[10]**

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	5
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

i) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non pre emptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.

ii) What is the turn around time and waiting time of each process for each scheduling algorithm?

iii) Which of the scheduling results in the minimal average waiting time (overall processes)?

SECTION - II

Q7) a) What is mutual exclusion? What are handware approaches for mutual exclusion. **[8]**

b) Explain deadlock detection algorithm with suitable example. **[8]**

OR

Q8) a) Describe the producer consumer problem and give solution for it. **[6]**

b) Consider the following snapshot of a system: **[10]**

	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				

Answer the following questions using the banker's algorithm.

i) What is the content of the matrix need?

ii) Is the system in a safe state? If yes give the safe sequence.

Q9) a) Write short note on demand paging. **[8]**

b) Discuss and compare with example various page replacement policies. **[8]**

OR

Q10)a) What is variable partitioning scheme? Differentiate between external and internal fragmentation. **[8]**

b) Explain the best fit algorithm used for memory allocation. What are advantages and disadvantages of this algorithm. **[8]**

Q11)a) Write an algorithm for disk scheduling algorithm using "shortest seek time first". **[10]**

b) Write and explain file structure and file attributes. **[8]**

OR

Q12)a) Explain RAID and it's different levels. **[10]**

b) Why I/O buffering is necessary? State and explain different I/O buffering techniques. **[8]**

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