Total No. of Questions : 12]

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## S.Y. M.C.A. (Engineering) (Semester - III)

## OPERATING SYSTEMS

## (2008 Course)

*Time : 3 Hours]* *[Max. Marks :70*

***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) *Your answers will be valued as a whole.*
5) *Assume suitable data, if necessary.*

## SECTION - I

*Q1)* a) Compare and contrast the properties of macros and subroutines with respect to the following : **[6]**

i) Code Space Requirement.
ii) Execution speed
iii) Processing required by assembler

b) Enlist the different types of errors that are handled by PASS-I and PASS-II Assembler. **[6]**

OR

*Q2)* a) What do you mean by Language processing? State various activities and Development tools. **[6]**

b) Write an algorithm or flowchart for PASS I of a two pass assembler. **[6]**

*Q3)* a) Explain the functioning of compile and go loader scheme. What are the advantages and disadvantages of this scheme? **[6]**

b) Explain Direct linking and Relocating loader. **[6]**

OR

*Q4)* a) What is Loader? What are its basic functions of loader? Explain its importance. **[6]**

b) Explain different phases of compilation in detail. **[6]**

**P.T.O.**

*Q5)* a) Write short note on : **[6]**

i) Real Time Operating Systems.

ii) Time sharing systems.

b) With the help of neat diagram explain state transition of a process. **[5]**

OR

*Q6)* a) Consider the following set of processes with the length of CPU Burst time given in milliseconds. **[6]**

| Process | Burst Time | Arrival Time | Priority |
|---|---|---|---|
| P1 | 8 | 0 | 4 |
| P2 | 6 | 1 | 6 |
| P3 | 7 | 3 | 3 |
| P4 | 9 | 3 | 1 |

Illustrate the execution of these process using Non pre-emptive SJF and Priority pre-emptive CPU scheduling algorithms. Also calculate average waiting time?

b) What are the different types of schedulers? Explain with suitable diagram. **[5]**

## SECTION-II

*Q7)* a) What is swapping? Explain how space is allocated using swapping. **[6]**

b) Why Demand paging approach is preferred over segmentation? Explain. **[6]**

OR

*Q8)* a) Explain address allocation and page replacement in virtual memory management. **[6]**

b) Consider the following page reference string.

1,2,3,4,5,3,4,1,6,7,8,7

How many page faults will occur for the following page replacement algorithms, assuming 3 frames. All are initially empty. **[6]**

i) Optimal replacement

ii) LRU replacement

*Q9)* a) Explain two level, tree structured and acyclic graph directories. **[6]**

b) Explain SCAN disk scheduling algorithm. What are the advantages and disadvantages of this algorithm? **[6]**

OR

*Q10)*a) Explain the following with respect to Disk scheduling. **[6]**

i) Seek Time
ii) Rotational Delay
iii) Transfer Time
iv) Access Time

b) Explain Programmed I/O and Interrupt driven I/O. **[6]**

*Q11)*a) Explain the following with respect to Linux system: **[6]**

i) Fork system call
ii) Exec system call

b) Explain components of a Linux system with diagram. **[5]**

OR

*Q12)*a) List the process management system calls and explain any two. **[6]**

b) What are the Kernel's responsibility to facilitate I/O transfer? **[5]**