Total No. of Questions : 12]

SEAT No. :

**P1670**

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## T.E. (Computer Engineering)

## SYSTEMS PROGRAMMING AND OPERATING SYSTEMS

## (2008 Course) (Theory) (Semester - II)

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

***Instructions to the candidates:***

1) ***Answer any three questions from each section.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***

## SECTION - I

***Q1)*** a) Draw flow chart for single pass macro processor to handle definitions inside definitions. **[10]**

b) Differentiate between literal and immediate operand. **[6]**

OR

***Q2)*** a) Explain the data structures required for 2 Pass Assembler. **[10]**

b) Define Macro. What are the advantages of macro facility? How they are different from functions? **[6]**

***Q3)*** a) Explain in brief compile and go scheme. What are advantages and disadvantages of it. **[10]**

b) What is the need of DLL? How dynamic linking can be done with or without import? **[6]**

OR

***Q4)*** a) Explain following terms: **[8]**

i) Subroutine Linkage.

ii) Relocation.

iii) Callback function.

iv) Overlay.

b) With the help of diagram explain the general loader scheme. **[8]**

***P.T.O.***

*Q5)* a) Describe the various features of UNIX OS. **[6]**

b) List out different structures of operating system? Describe each of them. **[12]**

OR

*Q6)* a) Explain different scheduling methods of processor. **[12]**

b) What are system calls? Enlist major category of system calls. **[6]**

## SECTION - II

*Q7)* a) Implement a solution to bounded buffer producer/consumer problem using Monitor. **[8]**

b) Explain the necessary conditions for occurrence of deadlock. **[4]**

c) What is critical region? Explain in detail. **[6]**

OR

*Q8)* a) Explain message passing mechanism for synchronization. **[6]**

b) Explain how mutual exclusion is achieved with hardware support using special machine instructions. State the advantages and disadvantages of using special machine instruction approach. **[8]**

c) What is Roll back? List the difficulties that may arise when a process is rolled back as a result of deadlock. **[4]**

*Q9)* a) Consider the following address register with 100 bytes page.

0100, 0432, 0101, 0612, 0102, 0103, 0104, 0451, 0256, 0611, 0102, 0103, 0104, 0610, 0103, 0234, 0104, 0321, 0613.

Calculate page faults:

i) LRU

ii) FIFO

iii) Optimal Frame size is 3.

Specify which algorithm is better? **[10]**

b) State and explain different memory management requirements. **[6]**

OR

***Q10)***a) Explain the following terms in brief: **[8]**

i) Lazy swapper.

ii) Thrashing.

iii) Working set model.

iv) Compaction.

b) Compare the different memory management techniques on their strengths and weaknesses. **[8]**

***Q11)***a) Explain concept of I/O buffer. **[8]**

b) Describe the 3 methods of record blocking with the help of neat diagrams. **[8]**

OR

***Q12)***a) Describe any four types of file organizations. **[8]**

b) The requested tracks in the order received are 55, 58, 39, 18,90, 160, 150, 38, 184. Starting track is 100. Perform the computation for the following disk scheduling algorithm: **[8]**

i) SSTF

ii) FCFS

iii) C-SCAN