Total No. of Questions : 8]

SEAT No. :

P3605

[Total No. of Pages : 3

[5560]-560

T. E. (E & TC)

SYSTEM PROGRAMMING & OPERATING SYSTEM

(2015 Course) (Semester - II)

Time : 2 ½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) Explain the terms w.r.t. language processing.

a) Lexical analysis, syntax analysis & semantic analysis with one example. **[7]**

b) What is function of loader? Explain different loading schemes with appropriate examples. **[7]**

c) Differentiate between pre-emptive & non-pre-emptive scheduling **[6]**

OR

Q2) a) Differentiate between macro & function with one example. **[7]**

b) What is need for code optimization? Explain methods of intermediate code generation. **[7]**

c) Consider following processes where arrival time and burst time are as followes. Calculate average waiting time and average turn around time if the processes are scheduled using SJF algorithm. **[6]**

Process	Burst time
P1	10
P2	20
P3	50
P4	70.

arrival time is 0 for all processes.

P.T.O.

Q3) a) What is dead lock in operating system? Explain in brief dead lock avoidance method. **[6]**

b) Explain Dinning Philosophers problem with solution. **[6]**

c) Find out the safe sequence for execution of 3 processes using bankers algorithm. **[6]**

Maximum resources are.

$R_1 = 15$

$R_2 = 08$

Allocation Matrix

	R_1	R_2	
P_1	2	1	
P_2	3	2	
P_3	3	0	

Maximum Required Matrix

	R_1	R_2
P_1	5	6
P_2	8	5
P_3	4	8

OR

Q4) a) What is semaphore? Explain how semaphore is used to solve critical section problem. **[6]**

b) Write a note on reader writer problem in process synchrorization. **[6]**

c) Find out safe sequence for execution of three processes using bankers algorithm. Number of instances of each resource types are **[6]**

$R_1 = 7, R_2 = 7, R_3 = 10.$

	R_1	R_2	R_3
P_1	2	2	3
P_2	2	0	3
P_3	1	2	4

Allocation Matrix

R_1	R_2	R_3
3	6	8
4	3	3
3	4	4

Maximum Required Matrix

Q5) a) Explain concept of paging & give significant advantages & disadvantages of the paging mechanism **[6]**

b) Paging system consist of physical memory 2^{24} bytes. Pages of total address space are 256 page size of 2^{10} bytes. How many bits are in the logical address. **[6]**

c) Consider the page reference string. **[4]**

→ 1 2 3 4 2 5 3 4 2 6 7 8 7 9
7 8 2 5 4 9.

Page frame size = 3.

Calculate page faults using LRU.

OR

Q6) a) Consider the page reference string as following **[6]**

2 3 2 1 5 2 4 5 3 2 5 2

Page frame size = 3

Calculate page faults using FIFO.

b) Given the memory partitions of size 100k, 500k, 200k, 300k, 600k in order. How would each of the first fit, best fit worst fit algorithms place the process of 300k, 530k, 190k, 425k. Which algorithm well make most efficient use of memory? Comment. **[6]**

c) Differentiate between paging & segmentation. **[4]**

Q7) a) Explain linux file system. **[6]**

b) Give significance of disc sheduling algorithms. Consider the following disc request sequence for a disc with 100 tracks. **[6]**

45 21 67 90 4 50 89 52 61 87 25

Head pointer is at 50

Calculate avg. seek length. With FCFS algorithm.

c) Explain different directory structures and directory operations. **[4]**

OR

Q8) a) Explain in brief : **[6]**

i) Interrupt driven I/O

ii) I/O using DMA

b) Explain I/O sofware layer **[6]**

c) Write a note on RAID disc **[4]**

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