Total No. of Questions : 8]

SEAT No. : ____

P1731

[Total No. of Pages : 4

[5460] - 560
T.E. (E & TC)
SYSTEM PROGRAMMING & OPERATING SYSTEM
(2015 Pattern) (Semester - II)

Time : 2½ Hours] ***[Max. Marks :70***

Instructions to the candidates:

1) ***Solve Q.1 or Q.2 and Q.3 or Q.4 and Q.5 or Q.6 and Q.7 or Q.8.***
2) ***Figures to the right side indicate full marks.***

Q1) a) Write difference between MACRO and FUNCTION with one example. **[7]**

b) Enlist the different loading schemes and explain in brief compile and go loader. **[7]**

c) Consider the following process where the arrival and burst time as shown below calculate average waiting time and turnaround time using FCFS algorithm **[6]**

	Burst time	Arrival time
P1	6	0
P2	4	4
P3	3	2

OR

Q2) a) In the analysis of a source program explain the significance and main functions of Lexical Analysis, Syntax Analysis and Semantic Analysis. **[7]**

b) Explain the significance and main functions of Loader in System software. **[7]**

c) Consider the following process where the arrival and burst time as shown below. If the quantum slice time is 2 calculate average waiting time and turnaround time using Round Robin algorithm. **[6]**

	Burst time	Arrival time
P1	05	0
P2	04	2
P3	07	4
P4	06	6

P.T.O.

Q3) a) What is mutual exclusion? Hence explain concept of Deadlock. **[6]**

b) What is producer Consumer problem? Explain how to solve it using semaphore. **[6]**

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

Maximum resources R1 = 15, R2 = 8.

	Allocation Matrix			Maximum Required	
	R1	R2		R1	R2
P1	2	1	P1	5	6
P2	3	2	P2	8	5
P3	3	0	P3	4	8

OR

Q4) a) Define Deadlock, explain the conditions under which deadlock occur? **[6]**

b) Explain the following terms under IPC. **[6]**

i) Shared Memory

ii) Message passing

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

Maximum resources R1 = 4, R2 = 4

	Allocation Matrix			Maximum Required	
	R1	R2		R1	R2
P1	1	0	P1	1	1
P2	1	1	P2	2	3
P3	1	2	P3	2	2

Q5) a) Differentiate between paging and segmentation. **[6]**

b) A computer has 4 page frames. Following table shows Time of loading, Time of last Access and R and M bits. Answer the following **[6]**

Page	Loaded	Last Reference	R	M
0	126	280	1	0
1	230	265	0	1
2	140	270	0	0
3	110	285	1	1

i) Which page will NRU replace.

ii) Which page will FIFO replace.

iii) Which page will LRU replace.

c) Consider the following page reference string
9,1,3,1,3,6,4,6,8,4,8,7,1,2
Number of page frames = 4
Calculate page fault and Hit ratio using LRU page replacement algorithm. **[4]**

OR

Q6) a) Consider the following page reference string

A,B,C,D,A,B,E,A,B,C,D,E

Calculate page fault with FIFO page replacement algorithm, when frame size 4. **[6]**

b) Explain demand paging and its advantages, also explain hardware support required to implement demand paging. **[6]**

c) Write a note on virtual memory. **[4]**

Q7) a) Write a note on **[6]**

i) Directory structure in OS

ii) File management system in OS

b) Explain DMA concept in detail. **[6]**

c) Calculate average seek length with the help of FCFS disk scheduling algorithm for the following track sequence **[4]**
90, 58, 55, 39, 18, 150

Current location of head is 55

OR

Q8) a) Write a short note on RAID disc. **[6]**

b) Enlist the various file operations. Explain access rights in file sharing. **[6]**

c) Explain file attributes. **[4]**

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