

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	5	6
P2	3	2	8	5
P3	3	0	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	1	1
P2	1	1	2	3
P3	1	2	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]

