Total No. of Questions : 8]

SEAT No. :

P3997

[Total No. of Pages : 4

[5353]-560

T.E. (E & TC) (Semester - II)

SYSTEM PROGRAMMING AND OPERATING SYSTEM

(2015 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q1 OR Q2 and Q3 OR Q4 and Q5 OR Q6 and Q7 OR Q8.***
2) ***Figures to the right indicate full marks.***

Q1) a) Consider the following process where the arrival and burst time as shown below calculate average waiting time and turnaround time using SJF algorithm **[7]**

	Burst time	Arrival time
P1	4	0
P2	7	2
P3	2	3
P4	2	3

b) Explain phases of compiler with one example **[7]**

c) Explain the following terms **[6]**

i) Macro definition

ii) Macro Call

iii) Nested Macro Call

Q2) a) Explain in brief what is mean by **[7]**

i) Imperative statements

ii) Declarative statement

iii) Assembler directive statements

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b) Consider the following process where the arrival and burst time as shown below. If the quantum slice time is 5 calculate average waiting time and turnaround time using Round Robin algorithm. **[7]**

	Burst time	Arrival time
A	10	00
B	06	00
C	07	01
D	04	01
E	05	02

c) Explain code optimization with suitable example **[6]**

Q3) a) Write a note on **[6]**

i) Dinning philosopher problem

ii) Producer consumer problem

iii) With respect to concurrency control mechanism

b) Explain inter process communication in detail **[6]**

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

Maximum resources R1=13 , R2=7, R3=10 units

	Allocation Matrix			Maximum Required			
	R1	R2	R3		R1	R2	R3
P1	2	1	1	P1	4	3	3
P2	7	2	3	P2	7	2	4
P3	3	2	2	P3	4	2	5
P4	1	1	3	P4	5	3	3

Q4) a) Write necessary conditions for deadlock **[6]**

b) Write a short note on semaphore with one example **[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

	R1	R2
P1	2	1
P2	3	2
P3	3	0

Maximum Required

	R1	R2
P1	5	6
P2	8	5
P3	4	8

Q5) a) Consider the following page reference string **[6]**

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

Number of page frames = 3

Calculate page fault and Hit ratio using FIFO page replacement algorithm

b) Consider memory partitions as **[6]**

100k,500k,200k,300k,and 600k in order. how would each of the first fit placement algorithm & best fit placement algorithm will place the processes of 212k,417k,112k,426k

Comment on the algorithm which makes the most efficient use of memory

c) What are types of memory fragmentations .Differentiate them on following points **[4]**

i) defination

ii) occurence

iii) solution

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

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

Number of page frames = 6

Calculate page fault and Hit ratio using LRU page replacement algorithm

b) Calculate the number of pages and number of frames in the system representing following specifications of addresses **[6]**

Logical address = 33 bits Physical address = 24 bits

Page size is 2Kbyte

c) Write a note on segmentation and its advantages **[4]**

Q7) a) Give classification of I/O devices. Hence explain any four properties of classification used for I/O devices **[6]**

b) Explain any two file organization techniques **[6]**

c) Calculate seek length with the help of FCFS disk scheduling algorithm for the following track sequence **[4]**

55,68,30,18,90,180,150,38,184

Current location of head is 140

Q8) a) What is buffering? Explain three types of buffering techniques **[6]**

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

c) Give difference between memory mapped I/O and I/O mapped I/O **[4]**