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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33216 Roll No.

B. Tech. Examination 2023-24

(Even Semester)

OPERATING SYSTEM

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

   (a) What do you mean by co-operating process?

   (b) What is mutual exclusion?

   (c) What is critical section?

   (d) Define deadlock strategies.

   (e) What is dynamic reallocation?

   (f) Write steps in handling a page fault.

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(g) What is swap space management?

(h) Describe the different types of access method.

SECTION B

2. Attempt any two parts of the following: 2×6 12

(a) What is the purpose of the system call or application programm interface (API)? Enumerate five system calls used in process management or file management.

(b) Which of the three types of scheduling is used to control the degree of multiprogramming?

(c) Write short notes on the following :

(i) Paging

(ii) Segmentation

(iii) Swapping

(d) Explain the file system and its function and how system calls are related with file system?

SECTION-C

Note :- Attempt all questions. Attempt any two parts from each questions. 8×5=40

3. (a) Write short notes on the following :

(i) CPU scheduling

(ii) Multiprocessor scheduling

(iii) Real time scheduling

(iv) Dispatcher

(v) Preemptive SJF

(b) Consider the following set of processes, find the average waiting time using Gantt chart for :

(i) SJF

(ii) Priority scheduling (lowest no. is highest priority)

Process	Burst Time	Priority
P_1	5	5
P_2	3	4
P_3	8	3
P_4	2	1
P_5	1	2

The process have arrived in the order P_2, P_1, P_4, P_3 and P_5.

with respect to IPC :

nchronous and asynchronous communi-
ation.

eed of buffering and its implementation.

onsist of five process (P_1, P_2, P_3, P_4,
rse resources (R_1, R_2, R_3). Resource
type R_1 has 10 instances, resource-type R_2 has 5
instances and R_3 has 7 instances. The following
snapshot of the system has been taken :
Find out the system is in safe state or safe
sequence.

Process	Allocation		
	R_1	R_2	R_3
	0	1	0
	2	0	0
	3	0	2
P_4	2	1	1
P_5	0	0	2

Max			Available		
R_1	R_2	R_3	R_1	R_2	R_3
7	5	3			
3	2	2			
9	0	2			
2	2	2			
4	3	3			

(b) Write short notes on the following :

(i) Semaphore

(ii) Producer consumer problem

(iii) Reader writer problem

(c) Explain the resource allocation graph. How resource allocation graph is useful in deadlock problem?

5. (a) Explain the following with reference to segmentation :

(i) Hardware support

(ii) Working

(iii) Protection and sharing

(b) Memory partitions of 100K, 500K, 200K, 300K and 600K (in order) how would each of the first fit, best fit and worst fit algorithms place proceses of 212 K, 417K, 112K and 426 K (in order)? Which algorithm makes the most efficient use of memory.

(c) Discuss the paging system for memory management in details. Also give its, advantages and disadvantages.

6. (a) Consider the following page-reference string :

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

How many page faults occur for the following replacement algorithms, assuming three frame:

(i) FIFO

(ii) LRU

(iii) Optimal

(b) Discuss about following in details :

(i) Demand paging

(ii) Thrashing

(c) Write short notes on the following :

(i) Transfer time

(ii) Rotational delay

(iii) Access time

(iv) Seek time

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