University of Sargodha

25616

BS 5th Term Examination 2020

Subject: Computer Science **Paper: Operating System (CMP-3621)**

Time Allowed: 2:30 Hours **Maximum Marks: 60**

Note: Objective part is compulsory. Attempt any three questions from subjective part.

Objective Part (Compulsory)

Q.1. Write short answers of the following in 2-3 lines each on your answer sheet. (12*2)

i. What is the difference between a Page and a Frame?
ii. Which one of the following scheduling algorithm could result in starvation? FCFS, SJF, Round Robin.
iii. What does it mean to Preempt a process?
iv. What is Belady's anomaly?
v. Differentiate between concurrency and parallelism.
vi. What exactly do you mean by CONTEXT in context switching?
vii. Differentiate between preemptive and non-preemptive scheduling
viii. Why do we call a program passive entity and a process active entity?
ix. Differentiate between progress and bounded-waiting.
x. What advantage is there in having different time-quantum sizes at different levels of a multilevel queuing system?
xi. What is the differences between deadlock avoidance, prevention and detection?
xii. FIFA and LRU both use previous information in page replacement policy. How is the one different from another then?

Subjective Part (3*12)

Q.2. For a data given below:

Process	Arrival Time	Burst Time
*P*1	0	8
*P*2	0	4
*P*3	1	2
P4	10	1

Calculate following by applying SJF algorithm and also draw Gantt charts for each.

a. Average Waiting Time (5)
b. Average Turnaround Time (5)
c. Average Response Time (2)

Q.3. a) What are the several possible remedies for deadlock in dining-philosopher problem? (6)
b) Describe the differences among short-term, medium-term, and long-term scheduling. (6)

Q.4. For the data given below:

	Allocation	*Need*	*Available*
	A B C	*A B C*	*A B C*
P_0	0 1 0	7 4 3	2 3 0
P_1	3 0 2	0 2 0	
P_2	3 0 2	6 0 0	
P_3	2 1 1	0 1 1	
P_4	0 0 2	4 3 1	

Apply Banker's algorithm and argue with reasoning whether requests should be granted or not.

a. Can request for (3,3,0) by P_4 be granted? (6)
b. Can request for (0,2,0) by P_0 be granted? (6)

Q.5. a) Consider the following page reference using three frames that are initially empty. Find the page faults using Optimal algorithm, where the page reference sequence:
7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1? (5)
b) Apply LRU on dataset provided in Question 5 part a, and compare the results. (7)

Q.6. Compare the memory organization schemes of contiguous memory allocation, segmentation, and paging with respect to the following issues:

a. External fragmentation [6]
b. Internal fragmentation [6]