



University of Central Punjab

(Incorporated by Ordinance No. XXIV of 2002 promulgated by Government of the Punjab)

Faculty of Information Technology & Computer Science

Mid-term Theory Exam, S23

NAME _____ REG# _____

Operating Systems

Time allowed: 90 Minutes.

Instructions

- All questions are mandatory.
- While we have made every effort to ensure the accuracy of this question paper, if you do find any errors, please make a sensible prediction and attempt to solve the question to the best of your ability.
- Understanding the problem is part of the problem.
- Solve Question#3 on the question paper and rest of the questions on the answer booklet.
- Correction, cutting, or overwriting in Question#3 is not allowed. If you do so, that part of the question will not be counted.

Question#1 (10 points)

Draw Gantt chart and calculate average wait time of the given processes using preemptive Priority scheduling policy. Lower numbers represent higher priority. (Note: Calculations must correlate with the Gantt chart.)

Processes	Arrival Time	CPU Burst	Priority
P0	0	6	4
P1	1	5	3
P2	2	3	2
P3	3	1	1
P4	4	2	0

Question#2 (4+5 points)

Shared memory and Anonymous PIPES are two basic IPC kernel constructs we have studied so far. (Your answer should be concise)

- Write two pros and cons of each of them.
- Discuss the scenario(s) where one is preferred over another.



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Question#3

Negative marking applies to this question. This question must be solved on question paper.
(10+6+15 points)

a) Write 'True (T)' or 'False (F)' against each statement in respective column.

S#	Statements	Microkernel	Monolithic kernel
1	Minimal kernel functionality		
2	Most services run as user-level processes		
3	Difficult to add new services or update existing ones		
4	Communication between kernel and user-level processes via message passing		
5	High degree of modularity and flexibility		

b) Write 'True (T)' or 'False (F)' against each statement in respective column.

S#	Statements	Program	Process
1	An entity that represents code stored on disk.		
2	An entity that is currently running can have an associated state.		
3	Have Stack segment and heap		

c) Write 'True (T)' or 'False (F)' against each statement in respective column.

S#	Statements	Multi-programming	Multi-tasking	Multi-processing
1	Allows multiple programs to run on a single CPU by switching between them.			
2	Enables multiple tasks to run on a single CPU concurrently by dividing CPU time between them.			
3	Requires multiple programs to reside in memory			
4	Involves the use of multiple CPUs working together to perform tasks.			
5	Can improve system performance by increasing CPU utilization.			