TARC
TUNKU ABDUL RAHMAN UNIVERSITY COLLEGE

AACS2284 - Mid-Term Test

STUDENT'S DECLARATION OF ORIGINALITY

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Mid-Term Test Submission

Course :	AACS2284 Operating Systems
Signature:	
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Programme of Study	DCS2
Tutorial Group	G5
Date & Time:	Saturday, 19 March 2022, 7:00 pm - 8:30 pm

Mark Summary

Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
Question 6	
TOTAL	

QUESTION 1 a) (6 marks)

Non - preemptive. It is because when a critical process enters the ready queue the process running CPU is not disturbed. Once resources(CPU Cycle) are allocated to a process, the process holds it till it completes its burst time or switches to waiting state. Process can not be interrupted until it terminates itself or its time is up. It does not have overheads. The cost is rigib.

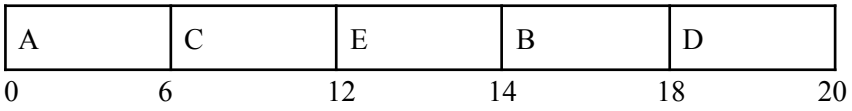
QUESTION 1 b) (6 marks)

Deadlock = Jack and Jill are making fried chicken at the same time, and both need a piece of chicken, so they both go to get the chicken and a knife.Jack gets the knife first, and Jill gets the chicken first. Now Jack is trying to find a piece of chicken and Jill is trying to find a knife, but both find that what they need to accomplish their mission is already in use. If they both decide to wait until what they need is no longer in use, they will wait forever for each other. Deadlock.

Starvation = There is only one check-in counter at the airport. There are two queues, one for business class and one for economy class. There are business meetings nearby though, and the business queue is always full. The economic queue does not move at all. If you happen to be in economy class, you will miss your plane.

QUESTION 2 a, b & c) (12 marks)

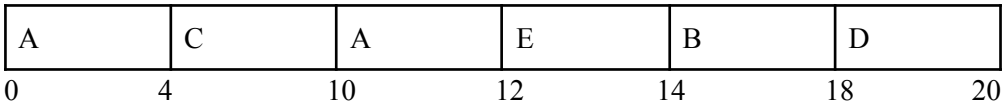
2a.



Process	Arrival Time	CPU Burst Time (ms)	Priority	Finish Time	Turnaro und time	Wait time
A	0	6	2	6	6	0
B	2	4	4	18	16	12
C	4	6	1	12	8	2
D	6	2	5	20	14	12
E	8	2	3	14	6	4

Turnaround time = (6 + 16 + 8 + 14 +6) / 5 = 10
Wait time = (0 + 12 + 2 + 12 + 4) / 5 = 6

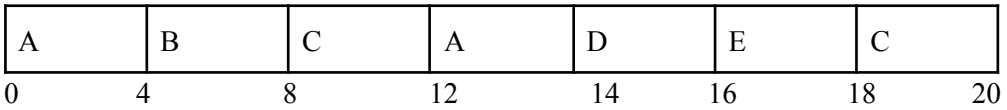
2b.



Process	Arrival Time	CPU Burst Time (ms)	Priority	Finish Time	Turnaround time	Wait time
A	0	6	2	12	12	6
B	2	4	4	18	16	12
C	4	6	1	10	6	0
D	6	2	5	20	14	12
E	8	2	3	14	6	4

Turnaround time = (12 + 16 + 6 + 14 +6) / 5 = 10.8
Wait time = (6 + 12 + 0 + 12 + 4) / 5 = 6.8

2c.

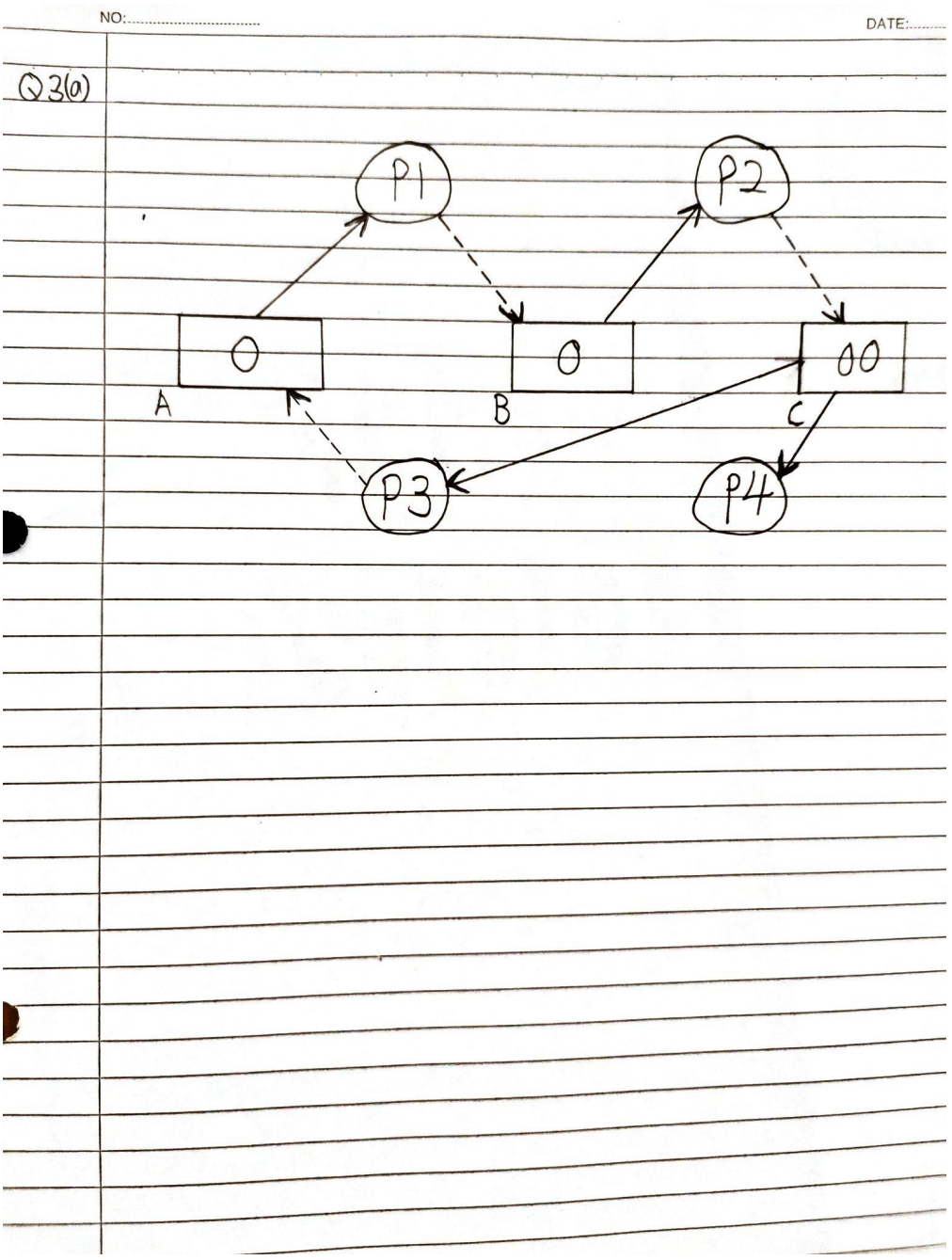


Process	Arrival Time	CPU Burst Time (ms)	Priority	Finish Time	Turnaround time	Wait time
A	0	6	2	14	14	8
B	2	4	4	8	6	2
C	4	6	1	20	16	10
D	6	2	5	16	10	8
E	8	2	3	18	10	8

Turnaround time = (14 + 6 + 16 + 10 + 10) / 5 = 11.2
Wait time = (8 + 2 + 10 + 8 + 8) / 5 = 7.2

QUESTION 3 a & b) **(8 marks)**

3a.



3b. No, P1 gets the resource B and executes. P2 gets the resource C after P4 releases resource C. P3 can get resource A after P1 releases A and

executes.

QUESTION 4 a & b) (6 marks)

4a

Partition	Process	Internal Fragmentation
A (100KB)	280KB	
B (480KB)	80KB	400KB
C (300KB)	350KB	
D (230KB)	220KB	10KB
E (600KB)		
	TOTAL	410KB

4b

Partition	Process	Internal Fragmentation
A (100KB)	80KB	20KB
B (480KB)	350KB	400KB
C (300KB)	280KB	20KB
D (230KB)	220KB	10KB
E (600KB)		
	TOTAL	450KB

QUESTION 5 a & b) (6 marks)

5a.

1	4	2	1	3	0	2	4	5	4	0	4

1	1	1	1	3	3	3	3	5	5	5	5
	4	4	4	4	0	0	0	0	0	0	0

		2	2	2	2	2	4	4	4	4	4
			H			H			H	H	H

Page fault = 7/12

5b.

1	4	2	1	3	0	2	4	5	4	0	4

1	1	1	1	3	4	4	4	5	5	5	5
	4	4	4	4	0	0	0	0	0	0	0
		2	2	2	2	2	2	4	4	4	4
			H			H	H		H	H	H

Page fault = 6/12

QUESTION 6) (6 marks)

Addressing within a 2048 word page requires 10 bits because 2048 = 2^11 . Since the logical address of 4096 = 2^12 pages, the logical address must be 11 + 12 = 23 bits.

Logical address

←——————————————————23——————————————————>

Page number	Page offset

←———————— 12 ———————————><———————— 11 ———————————>

Similarly, since there are 16 = 2^4 frames, physical addresses are 4 + 11 = 15.

Physical address

←——————————————————15——————————————————>

Frame number	Frame offset

←———————— 4 ———————————><———————— 11 ———————————>