NATIONAL UNIVERSITY OF SINGAPORE

CS2100 – COMPUTER ORGANISATION

(Semester 1: AY2015/16)

ANSWER BOOKLET

Time Allowed: 2 Hours

INSTRUCTIONS TO CANDIDATES

1. This answer booklet consists of **SIX (6)** printed pages.
2. Fill in your **Student Number** clearly on all odd-numbered pages.

STUDENT NUMBER (fill in with a pen):

For examiner's use only		
Question	***Total***	***Marks***
Q1-6	6	
Q7	8	
Q8	5	
Q9	6	
Q10	10	
Q11	7	
Q12	8	
Total	**50**	

Write your answers for the MCQs in the boxes below.

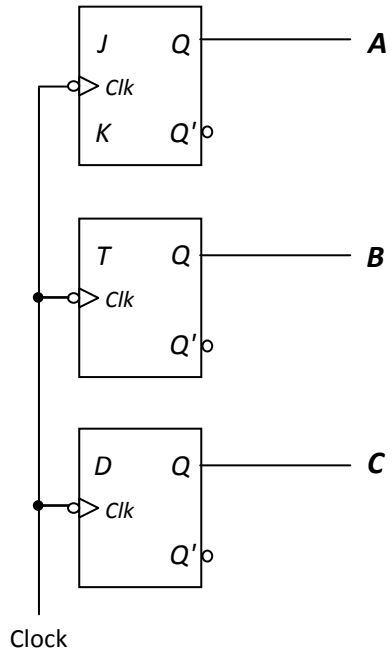
1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐ 6. ☐

Write your answers in the box/space provided.

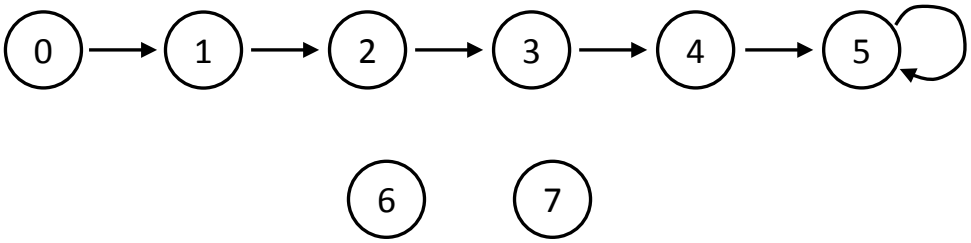
7a. [3]

KA = 0; *JA* = *TB* = *DC* =

7b. [2]



7c. [2]



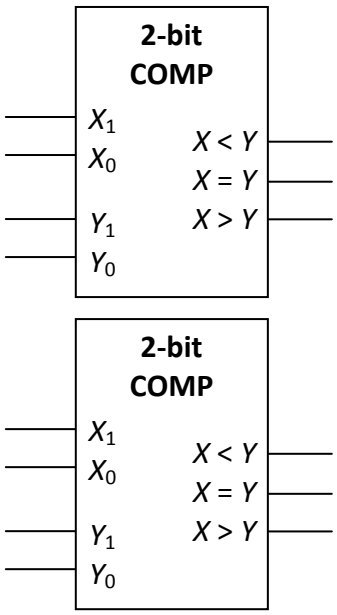
7c. [1]

Is the circuit self-correcting?

Why?

Marks for Q7: /8

8. [5]



(You may ignore the other comparator if you intend to use only one comparator.)

9a. [2]

RegDst = ALUSrc =

9b. [4]

Final value in **$s1** =

Explanation:

Marks for Q8: /5

Marks for Q9: /6

10a. [2]

Encoding in hexadecimal for **add $a1, $v0, $0**:

Encoding in hexadecimal for **srl $a1, $a1, 2**:

10b. [8]

Loop:

Marks for Q10: /10

11a. [2] What does the code do?

11b. [1] Which is the seventh instruction executed?

11c. [2] Total number of cycles =

Fill in the timing chart below:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
I1																					
I2																					
I3																					
I4																					
I5																					
I6																					

Indicate your seventh instruction here.

11d. [2] Total number of cycles =

Fill in the timing chart below:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
I1																					
I2																					
I3																					
I4																					
I5																					
I6																					

Indicate your seventh instruction here.

Marks for Q11: /7

12a. [2]

Cache hit rate =

12b. [6]

Block 0:				
Block 1:				
Block 2:				
Block 3:				
Block 4:				
Block 5:				
Block 6:				
Block 7:				

=== END OF PAPER ===

Marks for Q12: /8