CS2100 (AY2021/22 Semester 1) Answer Sheets

Student No: _____

(If you are using this file, remember to create a pdf file and rename it with your Student Number (eg: A1234567X.pdf). Write your answers in the box/space provided.)
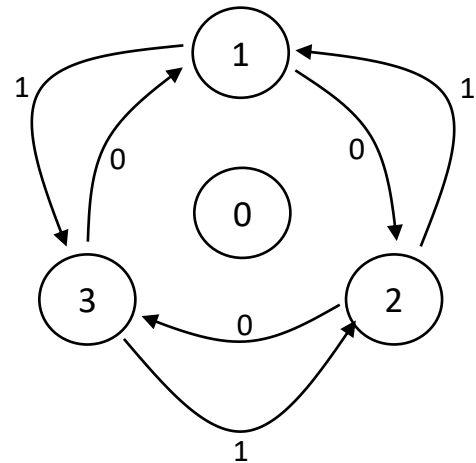
| 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |

| 7 | | 8 | | 9 | | 10 | | 11 | |

Q12. Sequential circuits [12 marks]

(a) (i) [4]

> **JA =**
>
> **KA =**

> **JB=**
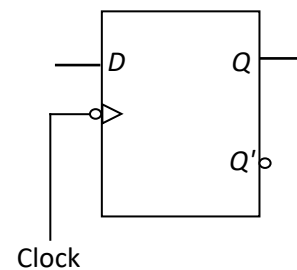>
> **KB =**

(ii) [2]

(b) (i) [3]

Clock

(ii) [3]

Clock
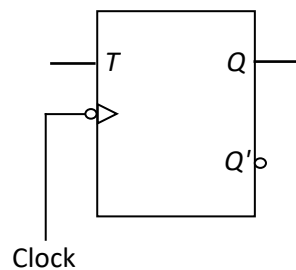
Q13. Combinational circuits [13 marks]

(a) [4]

$E(A,B,C,D) = \Sigma m$

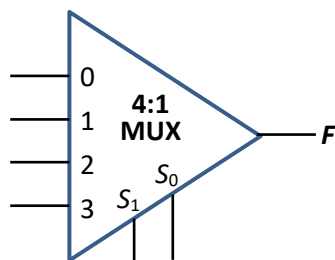$F(A,B,C,D) = \Sigma m$

$G(A,B,C,D) = \Sigma m$

$H(A,B,C,D) = \Sigma m$

(b) [4]

$K =$

(c) [5]

Q14. MIPS [13 marks]

(a)
[2]

(b)
[4]

(c)
[2]

(d)
[2]

(e)
[3]

Q15. Pipelining [14 marks]

(a)
[2]

(b)
[3]

(c)
[3]

(d)
[3]

(e)
[3]

Q16. Cache [18 marks]

(a)
[2]

Index: _____ ;   Byte offset: _____

(b)
[2]

Hit rate for array *A* =   ; Hit rate for array *B* =

(c)
[4]

Hit rate for array *A* =   ; Hit rate for array *B* =

(d)
[2]

Lowest hit rate for array *A* =

How many elements in array *A* would result in this hit rate?

(e)
[2+3]

Set index: _____ ;   Byte offset: _____

Number of misses: _____

(f)
[3]

Number of misses: _____