higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

LOGIC SYSTEMS N5

7 APRIL 2016

This marking guideline consists of 8 pages.

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QUESTION 1

0	0	.	x
0	1	1	x
1	0	x	1
1	1	x	.

A	B	C	D	Ja	Ka	Jb	Kb	Jc	Kc	Jd	Kd
1	1	1	1	x	.	x	.	x	.	x	1
1	1	1	0	x	.	x	.	x	1	1	x
1	1	0	1	x	.	x	.	.	x	x	1
1	1	0	0	x	.	x	1	1	x	1	x
1	0	1	1	x	.	.	x	x	.	x	1
1	0	1	0	x	.	.	x	x	1	1	x
1	0	0	1	x	.	.	x	.	x	x	1
1	0	0	0	x	1	1	x	1	x	1	x
0	1	1	1	.	x	x	.	x	.	x	1
0	1	1	0	.	x	x	.	x	1	1	x
0	1	0	1	.	x	x	.	.	x	x	1
0	1	0	0	1	x	x	.	1	x	1	x
0	0	1	1	1	x	1	x	x	.	x	.
0	0	1	0	1	x	1	x	x	.	1	x
0	0	0	1	1	x	1	x	1	x	x	.
0	0	0	0	1	x	1	x	1	x	1	x

Ja	00	01	11	10
00	1	1	x	x
01	1	.	x	x
11	1	.	x	x
10	1	.	x	x

Ja = (-c-d) + -b

Ka	00	01	11	10
00	x	x	.	1
01	x	x	.	.
11	x	x	.	.
10	x	x	.	.

Ka = (-B-C-D)

Jb	00	01	11	10
00	1	x	x	1
01	1	x	x	.
11	1	x	x	.
10	1	x	x	.

Jb = -A + (-C-D)

Kb	00	01	11	10
00	x	.	1	x
01	x	.	.	x
11	x	.	.	x
10	x	.	.	x

Kb = (a-C-D)

Jc	00	01	11	10
00	1	1	1	1
01	1	.	.	.
11	x	x	x	x
10	x	x	x	x

Jc = -D + (-A-B)

Kc	00	01	11	10
00	x	x	x	x
01	x	x	x	x
11	.	.	.	.
10	.	1	1	1

Kc = (b –d) + (a-d)

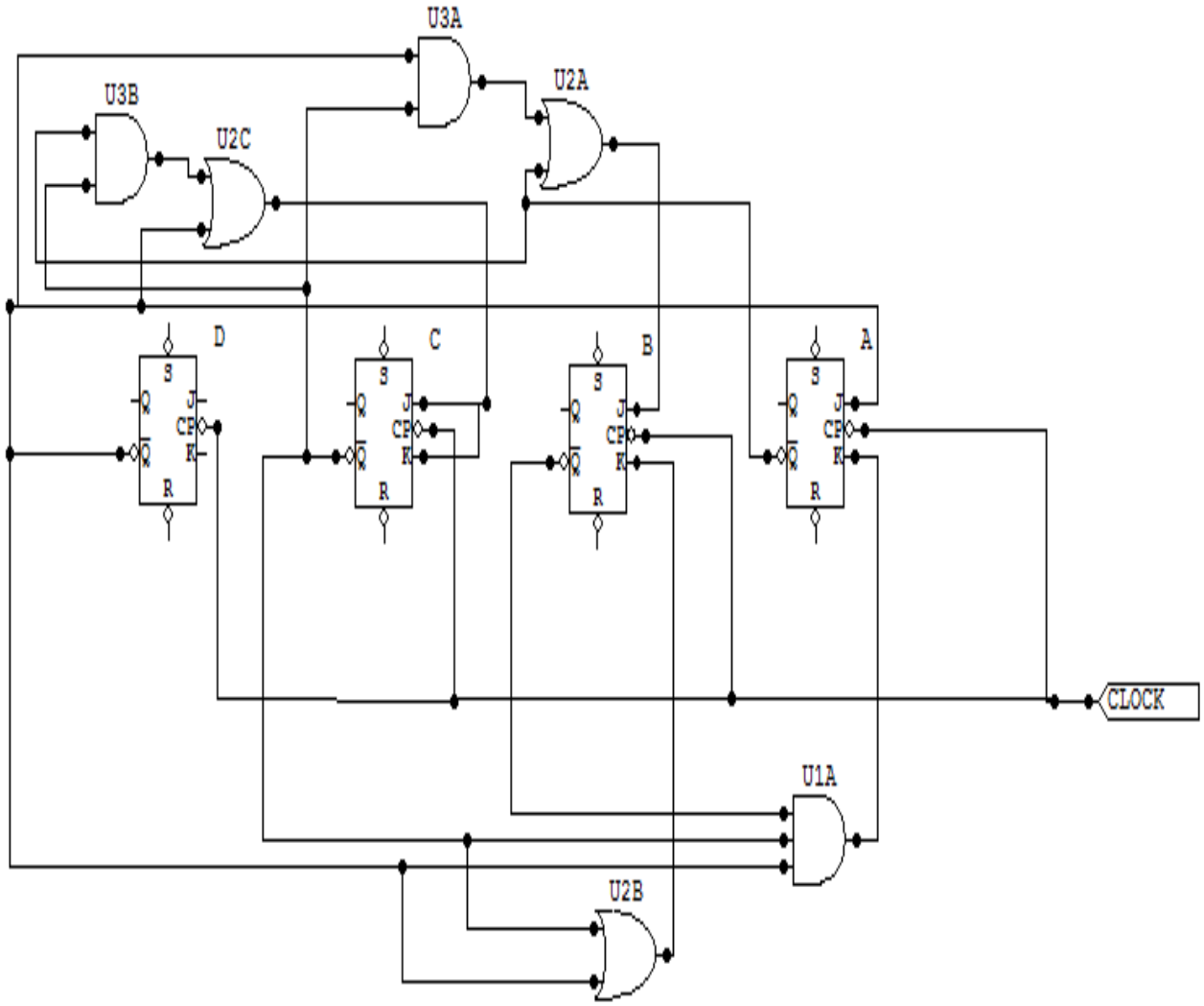
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Jd	00	01	11	10
00	X	1	1	1
01	1	x	x	x
11	1	x	x	x
10	X	1	1	1

Jd = 1

Kd	00	01	11	10
00	x	x	x	x
01	.	1	1	1
11	.	1	1	1
10	x	x	x	x

Kd = b+a

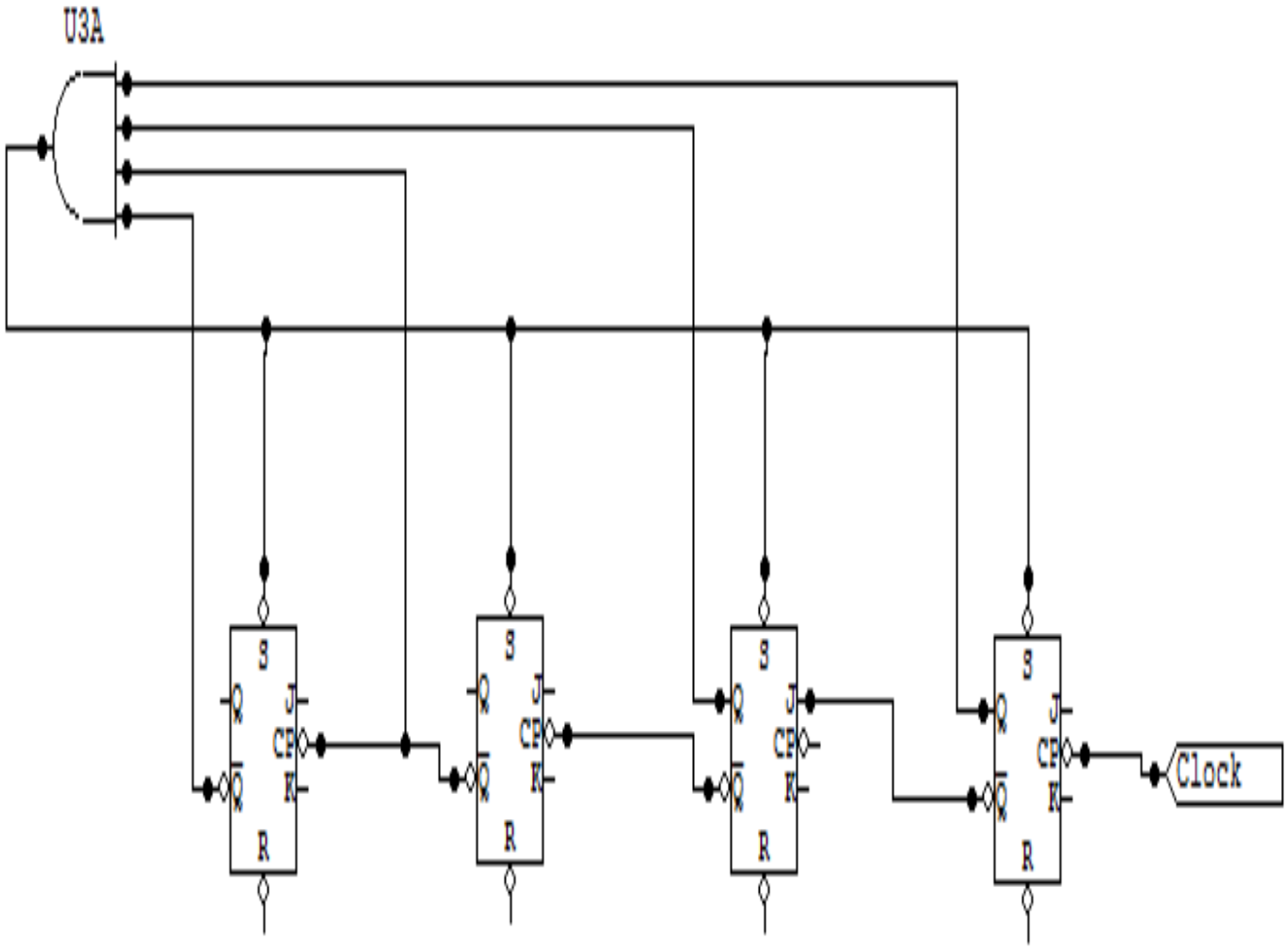


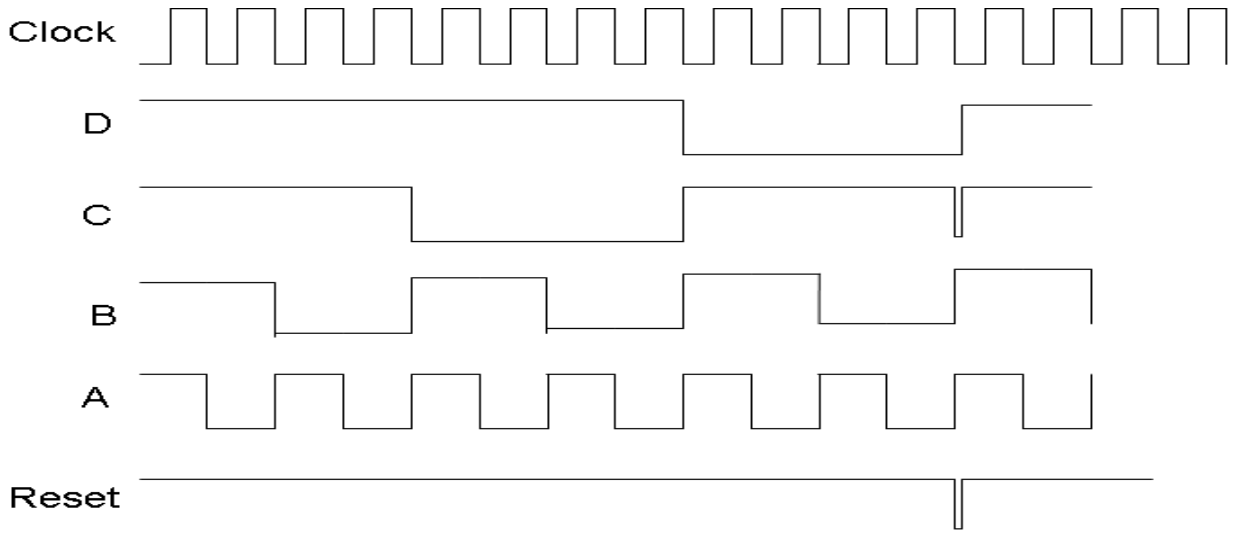
[15]

QUESTION 2

	A	B	C	D
15	1	1	1	1
14	1	1	1	0
13	1	1	0	1
12	1	1	0	0
11	1	0	1	1
10	1	0	1	0
9	1	0	0	1
8	1	0	0	0
7	0	1	1	1
6	0	1	1	0
5	0	1	0	1
4	0	1	0	0
3	0	0	1	1
2	0	0	1	0
1	0	0	0	1
0	0	0	0	0

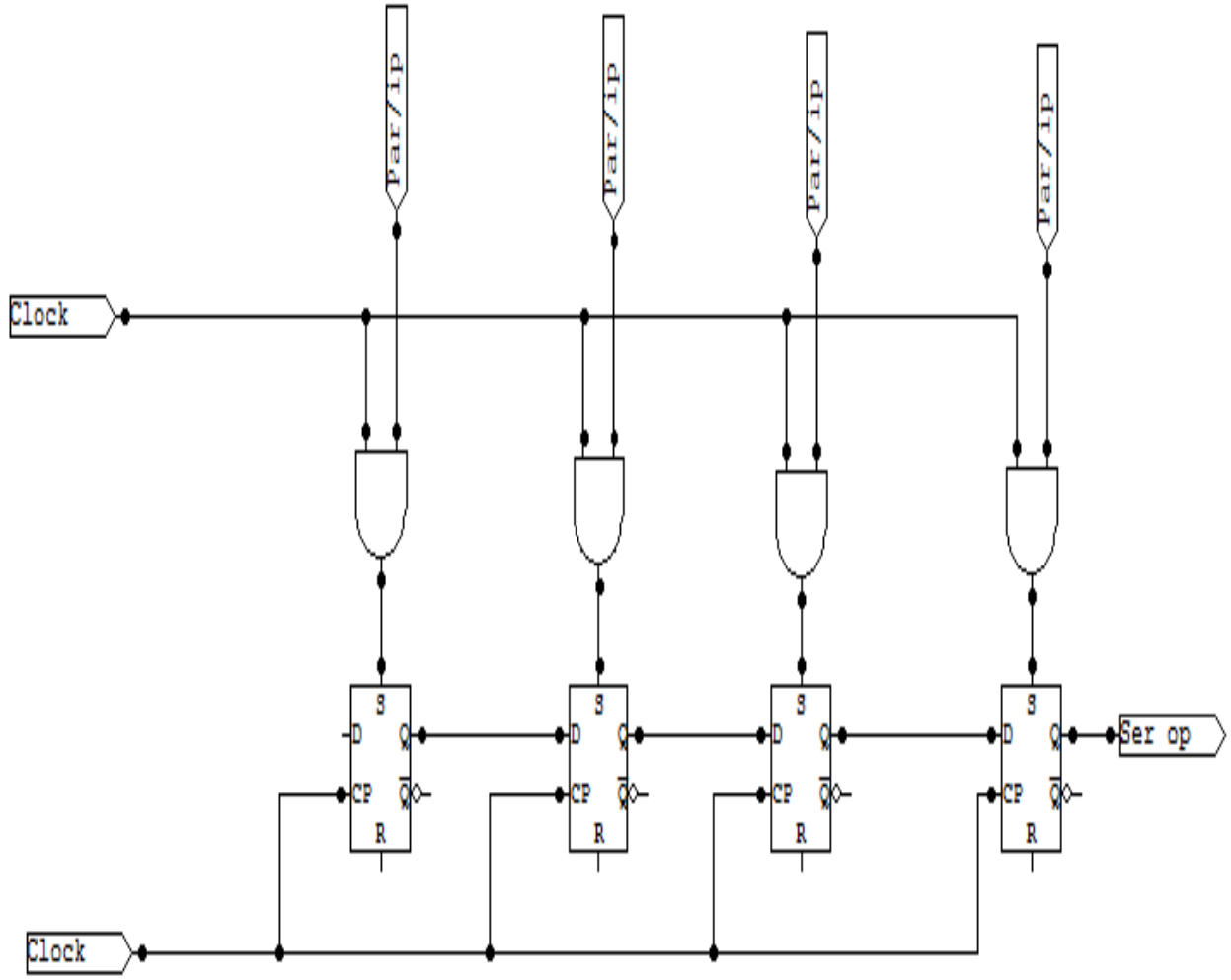
-A -B C D





Reset on 3, 15 – 4 down counter, Mod 12 down counter **[15]**

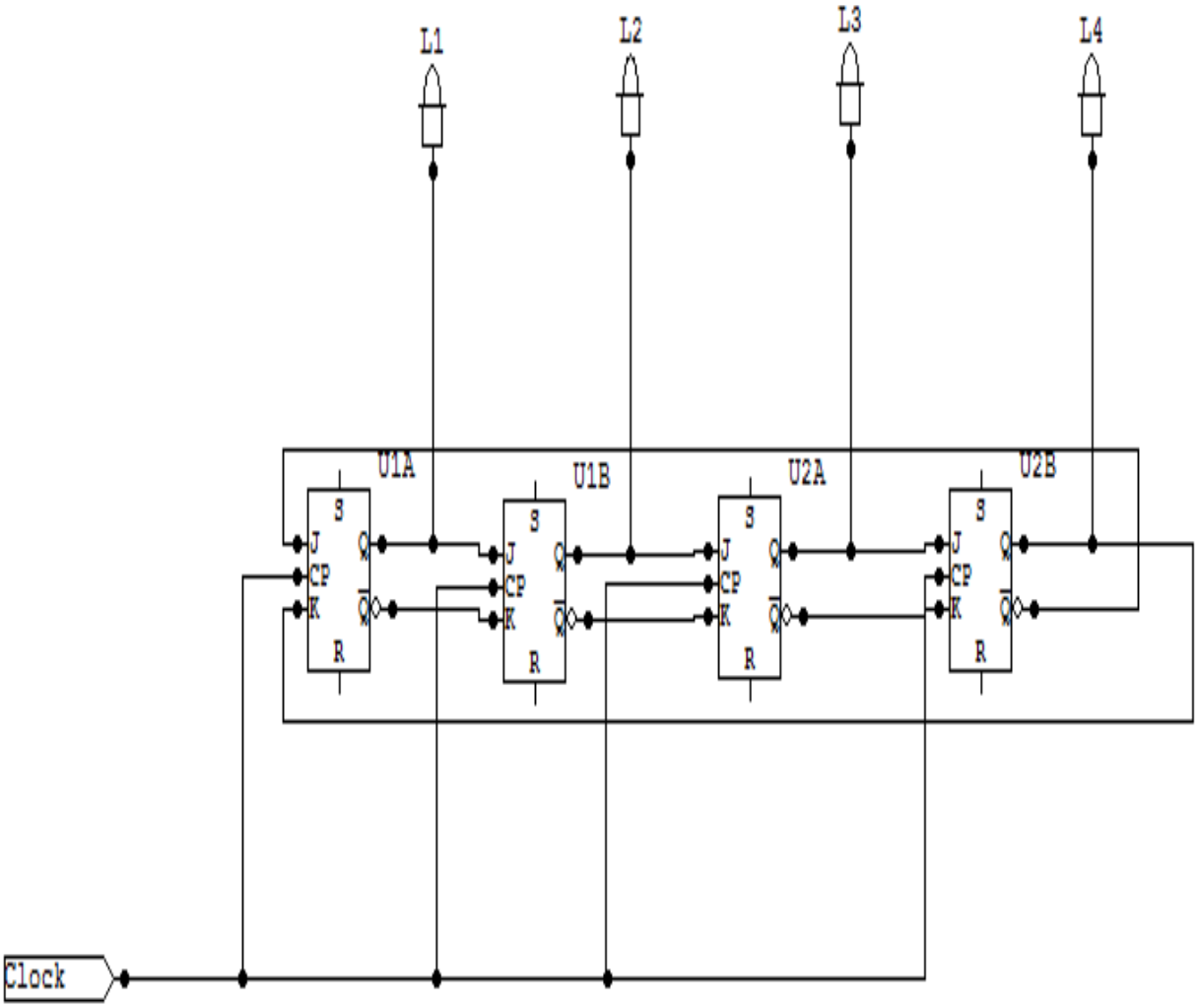
QUESTION 3



[10]

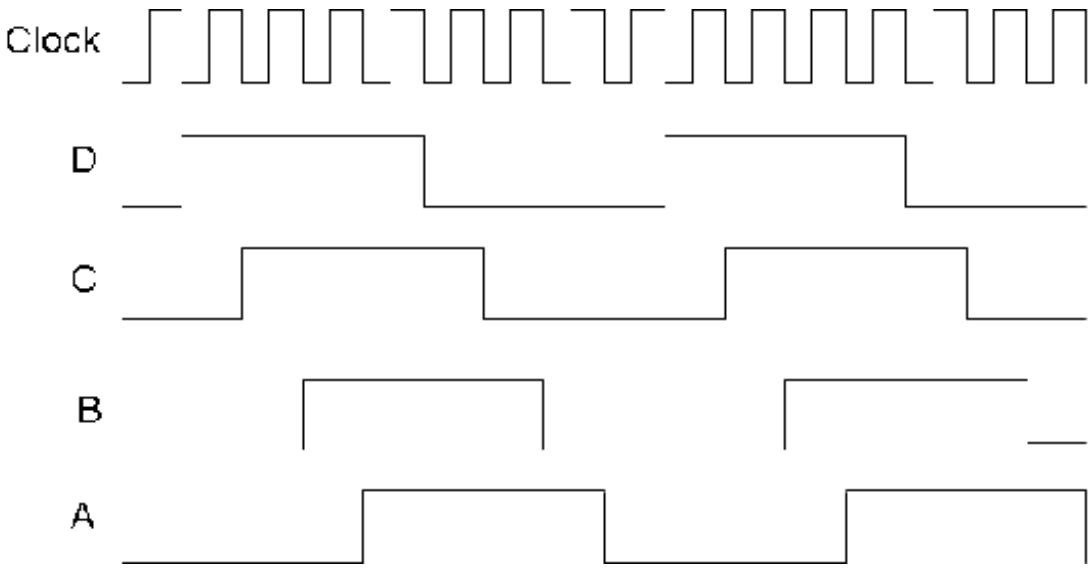
QUESTION 4

4.1



(5)

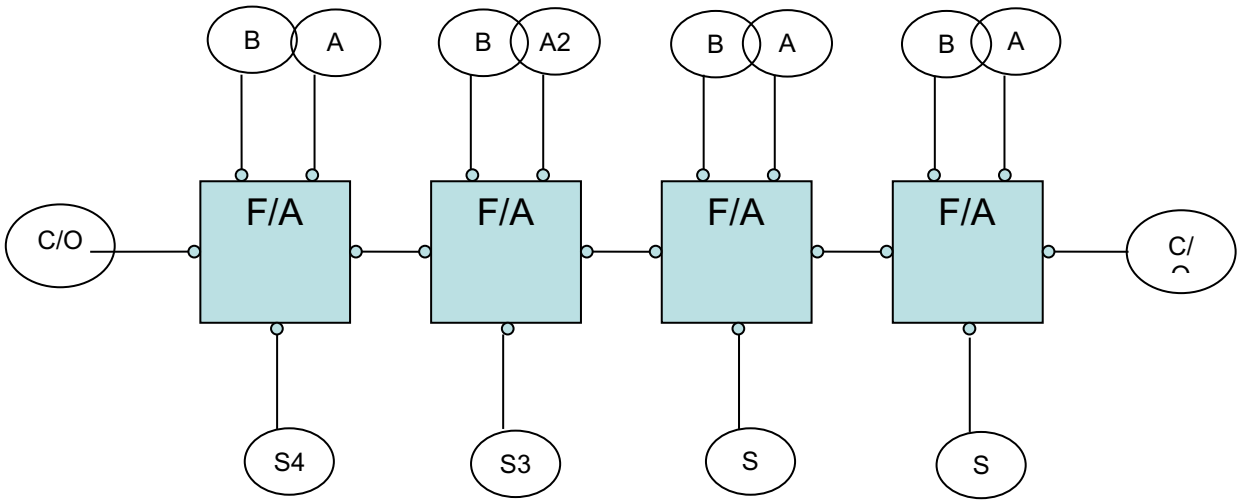
4.2



(5)
[10]

QUESTION 5

5.1

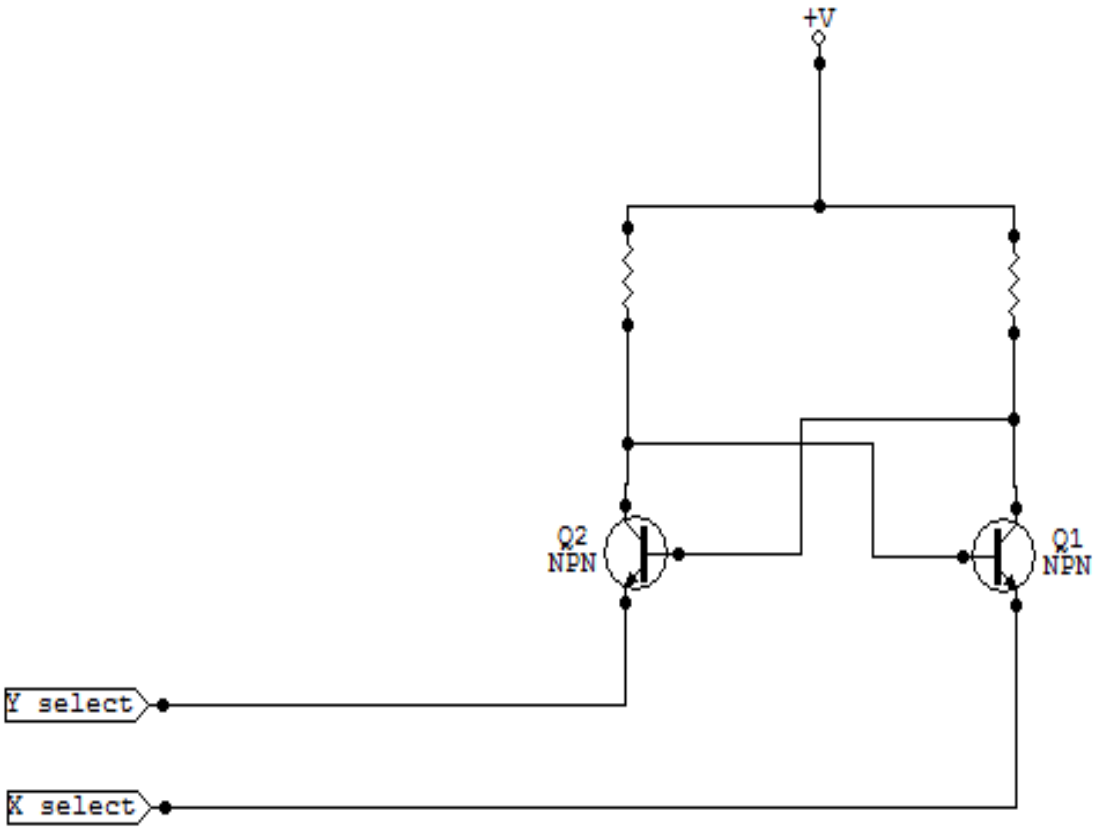


(5)

5.2 13 will be fed in to B1 to B4 in binary as 1101_2
7 will be fed in to A1 to A4 in binary as 0111_2
The full adders will add 0111_2 and 1101_2
And the answer 0100_2 will be displayed at S1 to S4 with a carry of 1 (5)
[10]

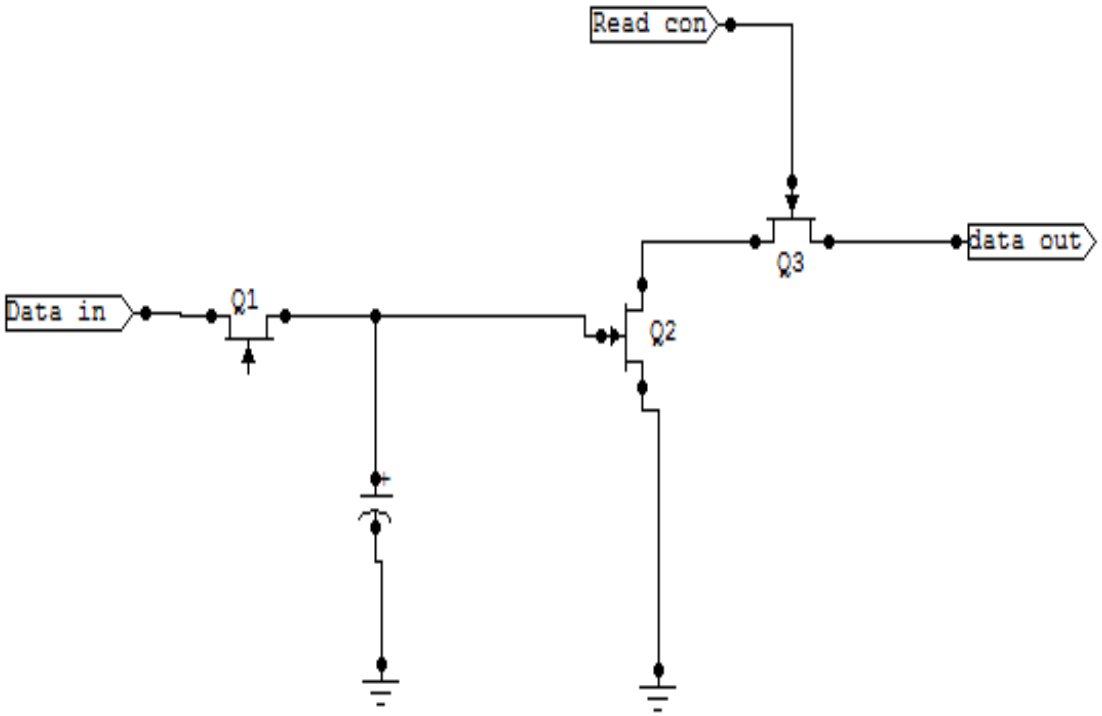
QUESTION 6

6.1



(10)

6.2



(10)
[20]

QUESTION 7:

7.1
- Dot matrix
- Chain
- Drum

(3)

7.2
- Laser
- Inkjet
- Thermal
- Static

(Any 3 × 1) (3)

7.3 The thermal printer will make use of a heat effect while the static printer will make use of a voltage charge effect (4)

7.4 7.4.1 Laser printer

7.4.2 Inkjet printer

7.4.3 Laser printer

7.4.4 Inkjet printer

7.4.5 Yes

(5 × 2) (10)
[20]

TOTAL: 100

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