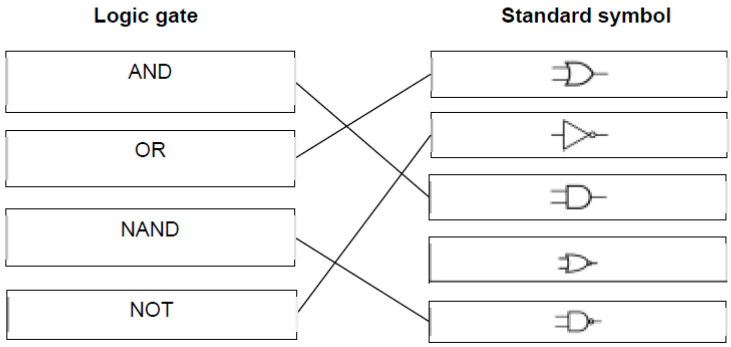
10 Boolean Logic
ANSWERS

Question	Answer	Marks
2	**One** mark for each correct line 	4

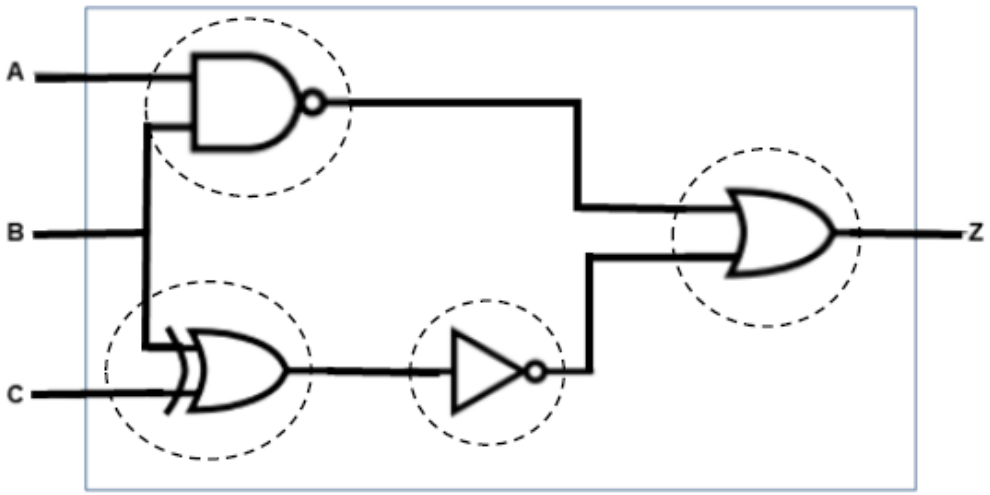
Question	Answer	Marks
7(a)	One mark for each point • NOT A • AND B • OR NOT C • expression correct (NOT A AND B) OR NOT C	4

Question	Answer	Marks
7(b)		4

A	B	C	X
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

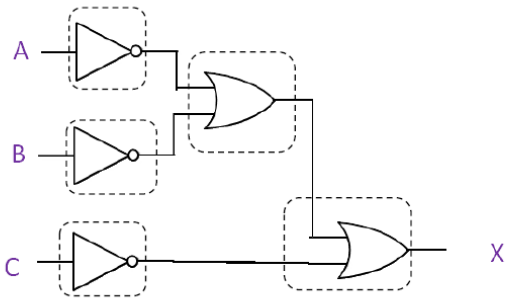
4 marks for 8 correct outputs
3 marks for 6/7 correct outputs
2 marks for 4/5 correct outputs
1 mark for 2/3 correct outputs

10 Boolean Logic
ANSWERS

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>9(a)</td><td>One mark for each correct gate, with the correct input(s) as shown.
 
</td><td>4</td></tr>
<tr><td>9(b)</td><td>Four marks for eight correct outputs.
Three marks for six or seven correct outputs.
Two marks for four or five correct outputs.
One mark for two or three correct outputs
<table>
<tr><th>A</th><th>B</th><th>C</th><th>Z</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td></tr>
</table></td><td>4</td></tr>
</table>

10 Boolean Logic
ANSWERS

Question	Answer	Marks
6(a)	**One** mark for correct gate and **one** mark for correct truth table **AND** **A** **B** **X** 0 0 0 0 1 0 1 0 0 1 1 1	**2**
6(b)	**One** mark for correct gate and **one** mark for correct truth table **XOR // EOR** **A** **B** **X** 0 0 0 0 1 1 1 0 1 1 1 0	**2**

Question	Answer	Marks
6(c)	**One** mark for correct gate and **one** mark for correct truth table **NOR** **A** **B** **X** 0 0 1 0 1 0 1 0 0 1 1 0	**2**
6(d)	**One** mark for each correct gate, with the correct input(s) as shown. 	**5**

10 Boolean Logic
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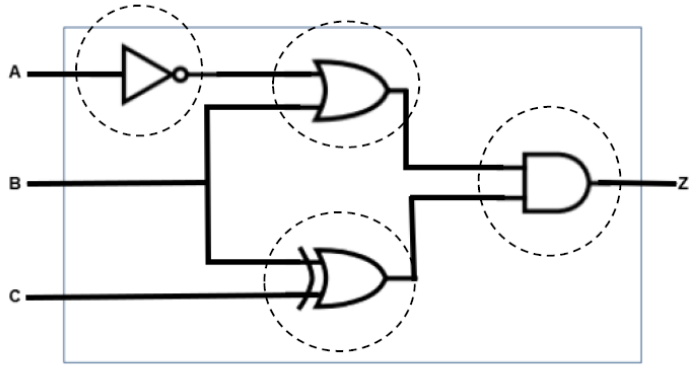
Question	Answer	Marks
9(a)	**One** mark for each correct gate, with the correct input(s) as shown. 	**4**

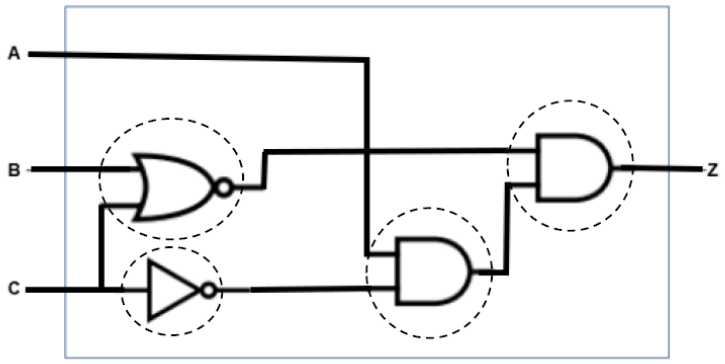
Question	Answer	Marks
9(b)	**Four** marks for eight correct outputs. **Three** marks for six or seven correct outputs. **Two** marks for four or five correct outputs. **One** mark for two or three correct outputs	**4**

A	B	C	Z
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

Question	Answer	Marks
8	4 marks for 8 correct outputs 3 marks for 6/7 correct outputs 2 marks for 4/5 correct outputs 1 mark for 2/3 correct outputs	**4**

A	B	C	X
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

10 Boolean Logic
ANSWERS

Question	Answer	Marks
8(a)	**One** mark for each correct gate, with the correct input(s) as shown. 	**4**

Question	Answer	Marks
8(b)	**Four** marks for eight correct outputs. **Three** marks for six or seven correct outputs. **Two** marks for four or five correct outputs. **One** mark for two or three correct outputs	**4**

A	B	C	Z
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

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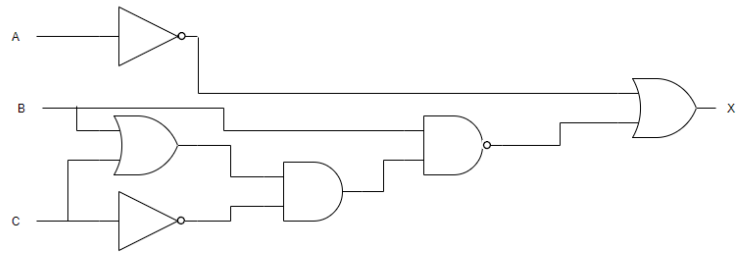
Answer	Marks

Truth table	Logic gate	
A | B | Output 0 | 0 | 1 0 | 1 | 1 1 | 0 | 1 1 | 1 | 0	NAND	[1]
A | B | Output 0 | 0 | 0 0 | 1 | 1 1 | 0 | 1 1 | 1 | 0	XOR / Exclusive OR	[1]
A | B | Output 0 | 0 | 1 0 | 1 | 0 1 | 0 | 0 1 | 1 | 0	NOR	[1]

3

Question	Answer	Marks
5(a)	**One** mark for each correct logic gate with correct input(s) 	6
5(b)	Any **one** from: • NOR • XOR // EOR	1

10 Boolean Logic
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Question	Answer	Marks
5(c)	**Four** marks for 8 correct outputs **Three** marks for 6/7 correct outputs **Two** marks for 4/5 correct outputs **One** mark for 2/3 correct outputs	**4**

A	B	C	Working space	X
0	0	0		**1**
0	0	1		**1**
0	1	0		**1**
0	1	1		**1**
1	0	0		**1**
1	0	1		**1**
1	1	0		**0**
1	1	1		**1**

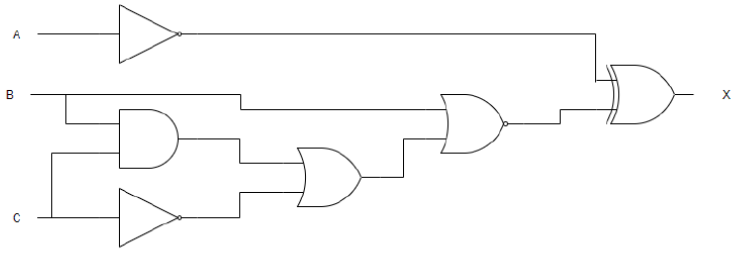
Question	Answer	Marks
7(a)	**One** mark for each correct row	**4**

Statement	NAND (✓)	OR (✓)	XOR (✓)
if both inputs are 1, the output is 1		✓	
if both inputs are different from each other, the output is 1	✓	✓	✓
if both inputs are 0, the output is 0		✓	✓
if both inputs are the same as each other, the output is always 0			✓

Question	Answer	Marks
7(b)	**One** mark for a correct logic gate, **one** mark for a corresponding truth table • AND	**2**

A	B	Output
0	0	0
0	1	0
1	0	0
1	1	1

Question	Answer	Marks
5(a)	**One** mark for each correct logic gate with the correct inputs	**6**

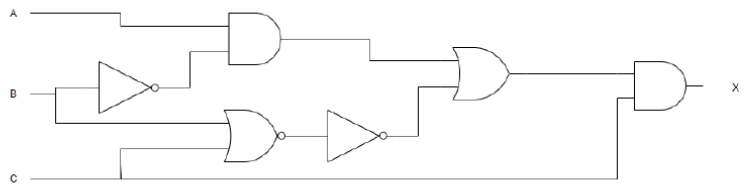


10 Boolean Logic
ANSWERS

Question	Answer	Marks
5(b)	**Four** marks for 8 correct outputs **Three** marks for 6/7 correct outputs **Two** marks for 4/5 correct outputs **One** mark for 2/3 correct outputs	**4**

A	B	C	Working space	X
0	0	0		**1**
0	0	1		**0**
0	1	0		**1**
0	1	1		**1**
1	0	0		**0**
1	0	1		**1**
1	1	0		**0**
1	1	1		**0**

Question	Answer	Marks
8(a)	**One** mark for each correct logic gate with correct input(s)	**6**



Question	Answer	Marks
8(b)	**Four** marks for 8 correct outputs **Three** marks for 6/7 correct outputs **Two** marks for 4/5 correct outputs **One** mark for 2/3 correct outputs	**4**

A	B	C	Working space	X
0	0	0		**0**
0	0	1		**1**
0	1	0		**0**
0	1	1		**1**
1	0	0		**0**
1	0	1		**1**
1	1	0		**0**
1	1	1		**1**

10 Boolean Logic
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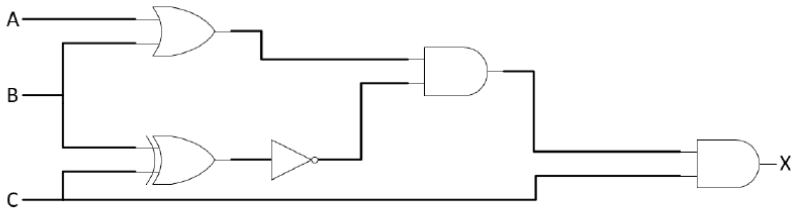
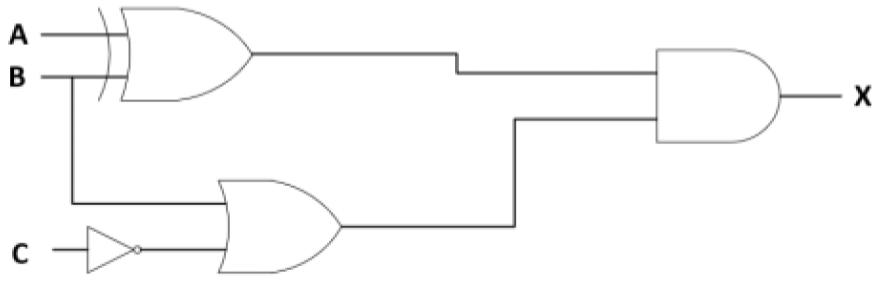
Question	Answer	Marks
5(a)	**One** mark for each correct logic gate with correct input(s) 	5
5(b)	**Four** marks for 8 correct outputs **Three** marks for 6/7 correct outputs **Two** marks for 4/5 correct outputs **One** mark for 2/3 correct outputs	4

A	B	C	Working space	X
0	0	0		**0**
0	0	1		**0**
0	1	0		**0**
0	1	1		**1**
1	0	0		**0**
1	0	1		**0**
1	1	0		**0**
1	1	1		**1**

Question	Answer	Marks
3(a)	1 mark per row	3

Inputs	AND	OR	NAND	NOR	XOR
A = 1 B = 1	✓	✓			
A = 0 B = 0			✓	✓	
A = 1 B = 0		✓	✓		✓

3(b)	1 mark per gate  • A XOR B • NOT C • (NOT C) OR B • AND	4

10 Boolean Logic
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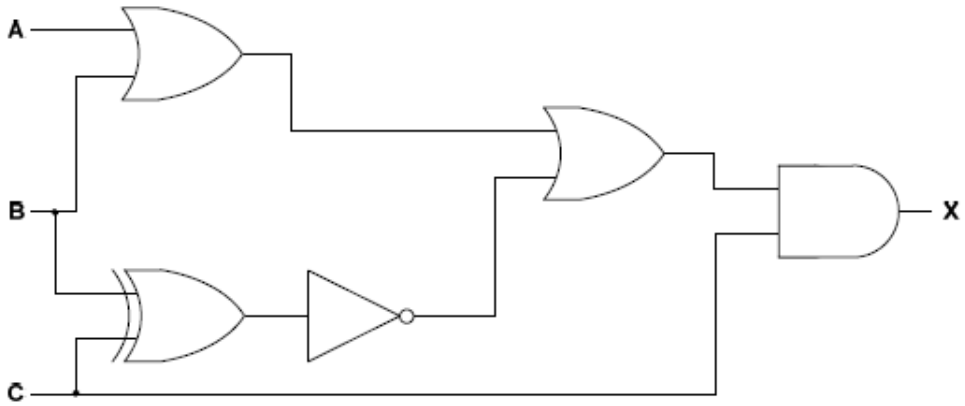
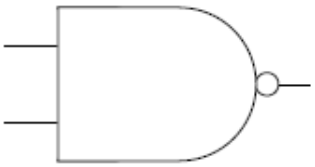
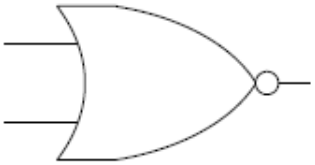
Question	Answer	Marks
10(a)	**One** mark per each correct logic gate with the correct input(s). 	**5**
10(b)	**One** mark per logic gate name and **one** mark per correct drawing. – NAND  – NOR 	**2**

10 Boolean Logic
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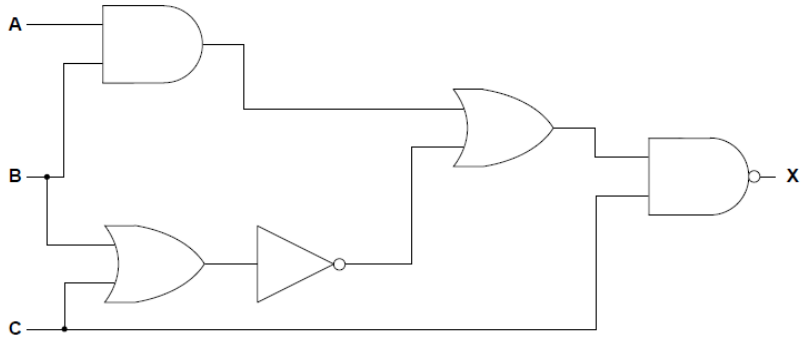
Question	Answer	Marks

10(c)

A	B	C	Working space	X
0	0	0		**0**
0	0	1		**0**
0	1	0		**0**
0	1	1		**1**
1	0	0		**0**
1	0	1		**1**
1	1	0		**0**
1	1	1		**1**

4 marks per 8 correct outputs
3 marks per 6/7 correct outputs
2 marks per 4/5 correct outputs
1 mark per 2/3 correct outputs

4

Question	Answer	Marks
11(a)	**One** mark per each correct logic gate with correct input(s) 	**5**

10 Boolean Logic
ANSWERS

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>11(b)</td><td>4 marks for 8 correct outputs
3 marks for 6/7 correct outputs
2 marks for 4/5 correct outputs
1 mark for 2/3 correct outputs

<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>11(c)</td><td>– NOR
– XOR / EOR</td><td>2</td></tr>
</table>

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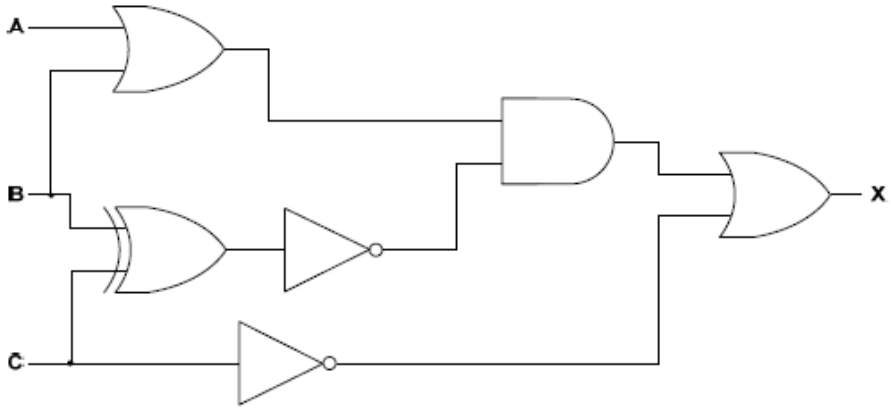
ANSWERS

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>8(a)</td><td>One mark per each correct logic gate with correct inputs
 
</td><td>6</td></tr>
<tr><td>8(b)</td><td>4 marks for 8 correct outputs
3 marks for 6/7 correct outputs
2 marks for 4/5 correct outputs
1 mark for 2/3 correct outputs
<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>1</td></tr>
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<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr>
</table></td><td>4</td></tr>
</table>

10 Boolean Logic
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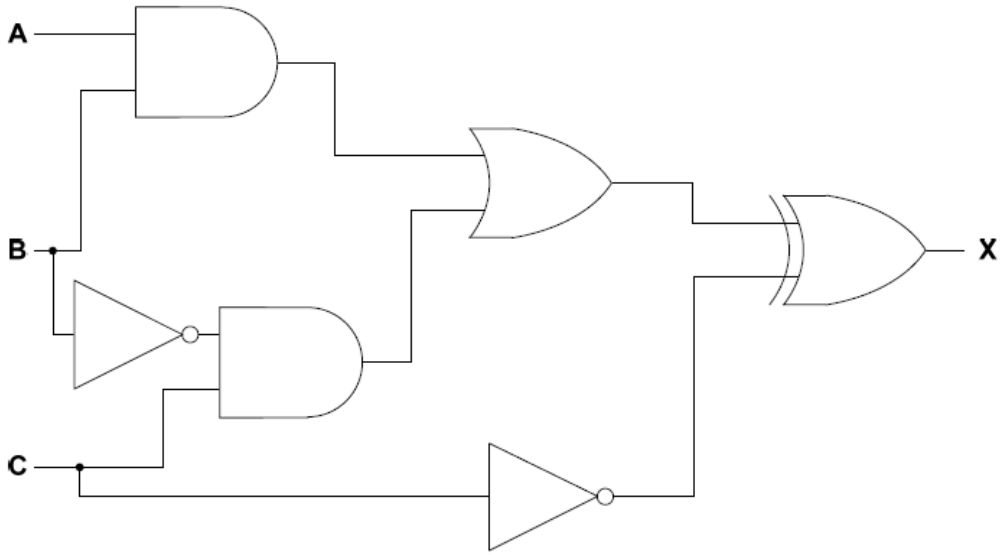
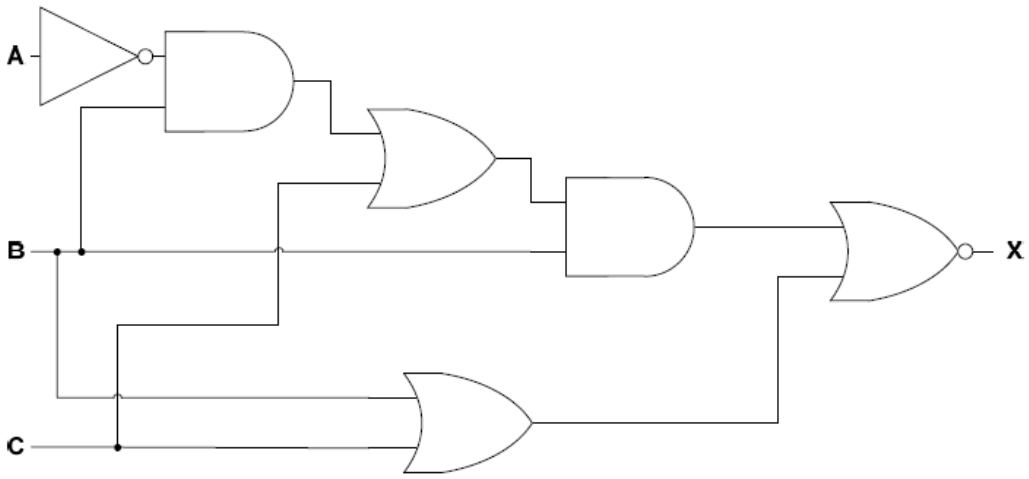
Question	Answer	Marks
6(a)	One mark per each correct logic gate, with correct input: 	6
6(b)	– Row 1 – Row 3 – Row 4 – Row 5	4
3(a)	One mark for each correct logic gate with correct input. 	6
3(b)	One mark per each correct row. – Row 2 – Row 3 – Row 7 – Row 8	4

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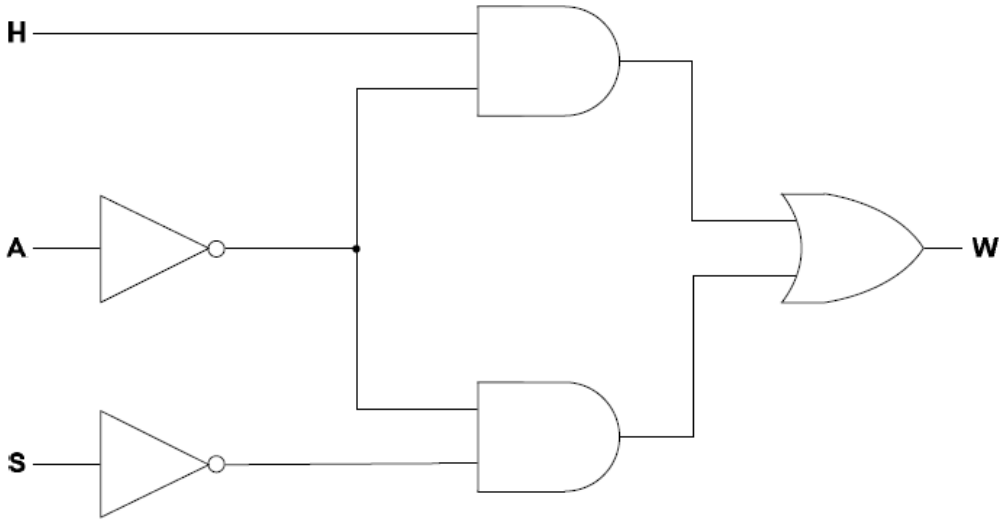
Question	Answer	Marks
8(a)	– AND – NOR – XOR	3
8(b)	– Row 1 – Row 4 – Row 7 – Row 8	4

Question	Answer	Marks
5(b)	**One** mark for each logic gates with correct inputs  – NOT A – NOT S – H AND NOT A – NOT A AND NOT S – Final OR	5