[redacted]

Started on	
State	
Completed on	
Time taken	
Marks	
Grade	
Feedback	

You are a highly motivated student, who takes full responsibility for your learning. A reflective learner, who recognises areas for development and is committed to personal improvement. An organised learner who always completes class work and homework to a very high standard.

Question **1**

Correct

Mark 1.00 out of 1.00

Suppose that you have the following boolean expression for X.

$X = C(A \oplus B) + AB'(C' + C) + (B' \oplus C).$

What would be the value of X if A = 0, B = 0, and C = 1?

Answer: 0 ✔

The correct answer is: 0

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:40	Saved: 0	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**1.00**

Question **2**

Correct

Mark 3.00 out of 3.00

Consider the two statements:

A = I will pass BCO

B = I will pass IAP

Match the following logical statements with the most appropriate description.

NOT A	I will not pass BCO ✔
NOT B	I will not pass IAP ✔
B **AND** A	I will pass both BCO and IAP ✔
A **OR** B	I will pass at least one of the courses (BCO or IAP) ✔
A **XOR** B	I will pass exactly one of the courses (BCO or IAP) ✔

Your answer is correct.

The correct answer is: **NOT** A → I will not pass BCO, **NOT** B → I will not pass IAP, B **AND** A → **I** will pass both BCO and IAP, A **OR** B → I will pass at least one of the courses (BCO or IAP), A **XOR** B → **I** will pass exactly one of the courses (BCO or IAP)

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:40	Saved: NOT A -> I will not pass BCO; NOT B -> I will not pass IAP; B AND A -> I will pass both BCO and IAP; A OR B -> I will pass at least one of the courses (BCO or IAP); A XOR B -> I will pass exactly one of the courses (BCO or IAP)	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**3.00**

Question **3**

Correct

Mark 1.00 out of 1.00

Suppose A and B are a binary values.

If A = 0 and B = 1 then compute:

NOT(A **XOR** B) **NAND** A

Answer: 1 ✔

The correct answer is: 1

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:42	Saved: 1	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**1.00**

Question **4**

Correct

Mark 1.00 out of 1.00

If I wanted to check if exactly 1 of the inputs were true, which logic gate would I use?

a. OR

b. NOR

c. XOR ✔

d. NAND

Your answer is correct.

The correct answer is:
XOR

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:42	Saved: XOR	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**1.00**

Question **5**

Correct

Mark 1.50 out of 1.50

A universal gate is a logic gate which can be used to implement any other type of logic gate. Which of the following are universal gates?

a. XOR and AND gates.

b. NAND and XOR gates.

c. NOR and NAND gates. ✔

d. None of the above.

Your answer is correct.

The correct answer is:
NOR and NAND gates.

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:43	Saved: NOR and NAND gates.	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**1.50**

Question **6**

Correct

Mark 1.00 out of 1.00

What is the minimum number of transistors required to implement an **NAND** gate?

Answer: 2 ✔

The correct answer is: 2

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:45	Saved: 2	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**1.00**

Question **7**

Correct

Mark 1.00 out of 1.00

What is the minimum number of transistors required to implement an **OR** gate?

Answer: 3 ✔

The correct answer is: 3

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:45	Saved: 3	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**1.00**

Question **8**

Correct

Mark 8.00 out of 8.00

By completing the truth table below, prove the following expression

A+A.B = A

A	B	A.B	A.B+A
0	0	0 ✔	0 ✔
0	1	0 ✔	0 ✔
1	0	0 ✔	1 ✔
1	1	1 ✔	1 ✔

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:46	Saved: part 1: 0; part 2: 0; part 3: 0; part 4: 0; part 5: 0; part 6: 1; part 7: 1; part 8: 1	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**8.00**

Question **9**

Correct

Mark 8.00 out of 8.00

Complete the truth table below to prove the Boolean expression: A.(B+C)=A.B+A.C

A B C	A.B	A.C	B+C	A.(B+C)	A.B+A.C
0 0 0	0	0	0	0	0
0 0 1	0	0	1	0	0
0 1 0	0	0	1	0	0
0 1 1	0	0	1	0	0
1 0 0	0	0	0	0	0
1 0 1	0	1	1	1	1
1 1 0	1	0	1	1	1
1 1 1	1	1	1	1	1

Response history

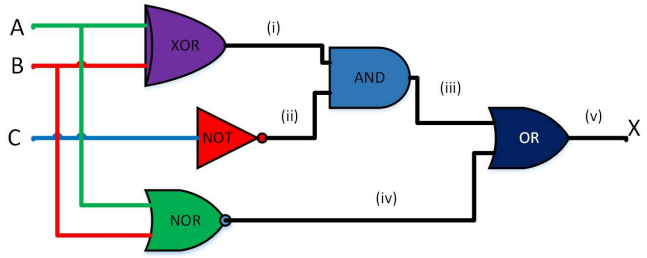
Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:50	Saved: part 1: 0; part 2: 0; part 3: 0; part 4: 0; part 5: 0; part 6: 0; part 7: 0; part 8: 1; part 9: 0; part 10: 0; part 11: 0; part 12: 0; part 13: 1; part 14: 0; part 15: 0; part 16: 0; part 17: 0; part 18: 1; part 19: 0; part 20: 0; part 21: 0; part 22: 0; part 23: 0; part 24: 0; part 25: 0; part 26: 0; part 27: 1; part 28: 1; part 29: 1; part 30: 1; part 31: 1; part 32: 0; part 33: 1; part 34: 1; part 35: 1; part 36: 1; part 37: 1; part 38: 1; part 39: 1; part 40: 1	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**8.00**

Question **10**

Partially correct

Mark 8.00 out of 8.00

Show the behaviour of the circuit given below by completing the below truth table.



A B C	(i)	(ii)	(iii)	(iv)	(v)
0 0 0	0	1	0	1	1
0 0 1	0	0	0	1	1
0 1 0	1	1	1	0	1
0 1 1	1	0	0	0	0
1 0 0	1	1	1	0	1
1 0 1	1	0	0	0	0
1 1 0	0	1	0	0	0
1 1 1	0	0	0	0	0

Write a Boolean expression for the above circuit in its simplest form?

C'(A'B + AB') + (A + B)'

✖ (e.g. (A.B'.C)' or C.(A+B))

NB: If you answer includes an XOR gate, then write it using NOT, AND, and OR gates.

Response history

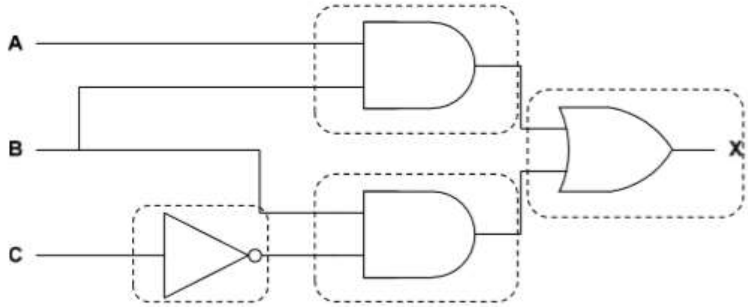
Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 12:57	Saved: part 1: 0; part 2: 1; part 3: 0; part 4: 1; part 5: 1; part 6: 0; part 7: 0; part 8: 0; part 9: 1; part 10: 1; part 11: 1; part 12: 1; part 13: 1; part 14: 0; part 15: 1; part 16: 1; part 17: 0; part 18: 0; part 19: 0; part 20: 0; part 21: 1; part 22: 1; part 23: 1; part 24: 0; part 25: 1; part 26: 1; part 27: 0; part 28: 0; part 29: 0; part 30: 0; part 31: 0; part 32: 1; part 33: 0; part 34: 0; part 35: 0; part 36: 0; part 37: 0; part 38: 0; part 39: 0; part 40: 0; part 41:	Incomplete answer	
3	26/04/23, 13:05	Saved: part 1: 0; part 2: 1; part 3: 0; part 4: 1; part 5: 1; part 6: 0; part 7: 0; part 8: 0; part 9: 1; part 10: 1; part 11: 1; part 12: 1; part 13: 1; part 14: 0; part 15: 1; part 16: 1; part 17: 0; part 18: 0; part 19: 0; part 20: 0; part 21: 1; part 22: 1; part 23: 1; part 24: 0; part 25: 1; part 26: 1; part 27: 0; part 28: 0; part 29: 0; part 30: 0; part 31: 0; part 32: 1; part 33: 0; part 34: 0; part 35: 0; part 36: 0; part 37: 0; part 38: 0; part 39: 0; part 40: 0; part 41: (NOT C) AND (A XOR B) OR (NOT (A OR B))	Answer saved	
4	26/04/23, 13:15	Saved: part 1: 0; part 2: 1; part 3: 0; part 4: 1; part 5: 1; part 6: 0; part 7: 0; part 8: 0; part 9: 1; part 10: 1; part 11: 1; part 12: 1; part 13: 1; part 14: 0; part 15: 1; part 16: 1; part 17: 0; part 18: 0; part 19: 0; part 20: 0; part 21: 1; part 22: 1; part 23: 1; part 24: 0; part 25: 1; part 26: 1; part 27: 0; part 28: 0; part 29: 0; part 30: 0; part 31: 0; part 32: 1; part 33: 0; part 34: 0; part 35: 0; part 36: 0; part 37: 0; part 38: 0; part 39: 0; part 40: 0; part 41: C'(A'B + AB') + (A + B)'	Answer saved	
5	**26/04/23, 13:17**	**Attempt finished**	**Partially correct**	**8.00**

Question **11**

Correct

Mark 8.00 out of 8.00

Given the Circuit complete its truth table:



A	B	C	X
0	0	0	a
0	0	1	b
0	1	0	c
0	1	1	d
1	0	0	e
1	0	1	f
1	1	0	g
1	1	1	h

a: 0 ✔

b: 0 ✔

c: 1 ✔

d: 0 ✔

e: 0 ✔

f: 0 ✔

g: 1 ✔

h: 1 ✔

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	

Step	Time	Action	State	Marks
2	26/04/23, 13:02	Saved: part 1: 0; part 2: 0; part 3: 1; part 4: 0; part 5: 0; part 6: 0; part 7: 1; part 8: 1	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**8.00**

Question **12**

Correct

Mark 8.00 out of 8.00

Complete the truth table below to prove that A.B + C = (A + C).(B + C)

A B C	A+C	B+C	(A+C).(B+C)	A.B	A.B+C
0 0 0	0	0	0	0	0
0 0 1	1	1	1	0	1
0 1 0	0	1	0	0	0
0 1 1	1	1	1	0	1
1 0 0	1	0	0	0	0
1 0 1	1	1	1	0	1
1 1 0	1	1	1	1	1
1 1 1	1	1	1	1	1

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 13:08	Saved: part 1: 0; part 2: 0; part 3: 0; part 4: 0; part 5: 0; part 6: 1; part 7: 1; part 8: 1; part 9: 0; part 10: 1; part 11: 0; part 12: 1; part 13: 0; part 14: 0; part 15: 0; part 16: 1; part 17: 1; part 18: 1; part 19: 0; part 20: 1; part 21: 1; part 22: 0; part 23: 0; part 24: 0; part 25: 0; part 26: 1; part 27: 1; part 28: 1; part 29: 0; part 30: 1; part 31: 1; part 32: 1; part 33: 1; part 34: 1; part 35: 1; part 36: 1; part 37: 1; part 38: 1; part 39: 1; part 40: 1	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**8.00**

Question **13**

Correct

Mark 2.00 out of 2.00

Use the rules of Boolean algebra to simplify the expression

A′(A + B) + (B + A.A)(A + B′)

Select one:

- (A'.B')'
- (A+B)'
- (A'+B)'
- B'
- A XOR B
- A+B ✔
- A.B+B
- A.B
- A'.B
- A+A'.B
- A+B+AB'
- A′.B + B′.B
- B+A+AB'
- A.B + A'.B

The correct answer is: A+B

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 13:11	Saved: A+B	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**2.00**

Question **14**

Correct

Mark 2.00 out of 2.00

Use the rules of Boolean algebra to simplify the expression

(A + C)(A.D + A.D') + A.C + C

So that it can be represented by a single logic gate.

Select one:

- (A+C)'
- A+C ✔
- A.B
- A.C'
- A XOR C
- C'+A
- A.C
- C'
- A'.C
- A'.C
- C XOR A
- A+C.A

The correct answer is: A+C

Response history

Step	Time	Action	State	Marks
1	26/04/23, 12:37	Started	Not yet answered	
2	26/04/23, 13:13	Saved: A+C	Answer saved	
3	**26/04/23, 13:17**	**Attempt finished**	**Correct**	**2.00**

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