

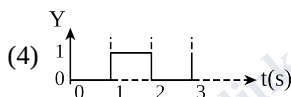
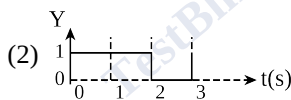
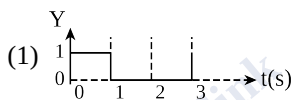
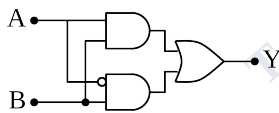
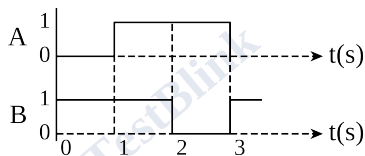
JEE MAIN SEMICONDUCTOR ELECTRONICS — LOGIC GATES (OR, AND, NOT, NAND, NOR) — PYQS

Max. Marks: 72
Questions: 18

Section A (MCQ) — 18 questions

Q.1 The output Y for the given inputs A and B to the circuit is :

[JEE Main 2026 (Online) 8th April Evening Shift]

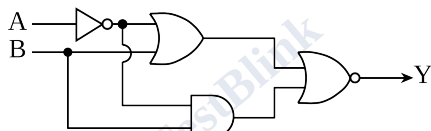


Scan or tap for the full solution



Q.2 Refer to the logic circuit given below. For two inputs ($A = 1, B = 1$) and ($A = 0, B = 1$), output (Y) will be _____.

[JEE Main 2026 (Online) 6th April Evening Shift]



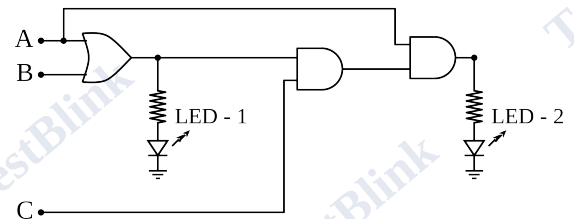
- (1) 1, 0 respectively (2) 0, 1 respectively
(3) 0, 0 respectively (4) 1, 1 respectively

Scan or tap for the full solution



Q.3 For the given logic circuit, which of the following inputs combination will make both LED-1 and LED-2 to glow?

[JEE Main 2026 (Online) 5th April Morning Shift]



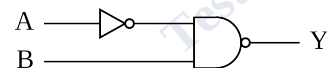
- (1) $A = 0, B = 1, C = 1$ (2) $A = 1, B = 0, C = 0$
(3) $A = 1, B = 0, C = 1$ (4) $A = 1, B = 1, C = 0$

Scan or tap for the full solution



Q.4 Two 4 bits binary numbers, $A = 1101$ and $B = 1010$ are given in the inputs of a logic circuit shown in figure below. The output (Y) will be :

[JEE Main 2026 (Online) 4th April Morning Shift]

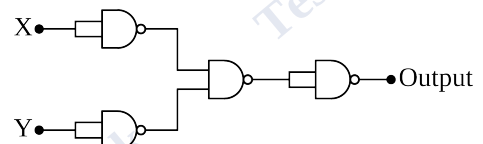


- (1) $Y = 1101$ (2) $Y = 0010$
(3) $Y = 0111$ (4) $Y = 1000$

Scan or tap for the full solution



Q.5 If X and Y are the inputs, the given circuit works as _____. [JEE Main 2026 (Online) 2nd April Evening Shift]



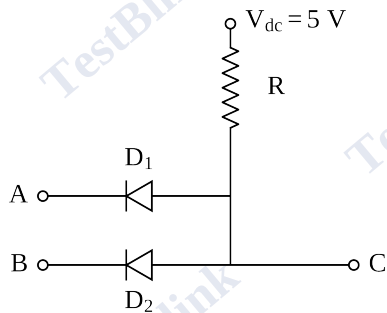
- (1) OR gate (2) AND gate
(3) NAND gate (4) NOR gate

Scan or tap for the full solution



Q.6 Two p-n junction diodes D_1 and D_2 are connected as shown in figure. A and B are input signals and C is the output. The given circuit will function as a _____.

[JEE Main 2026 (Online) 28th January Evening Shift]



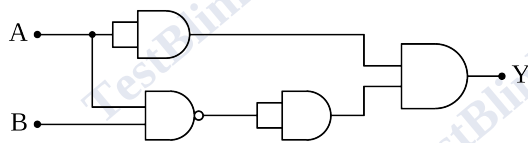
- (1) AND Gate (2) OR Gate
(3) NOR Gate (4) NAND Gate

Scan or tap for the full solution



Q.7 Identify the correct truth table of the given logic circuit.

[JEE Main 2026 (Online) 24th January Evening Shift]



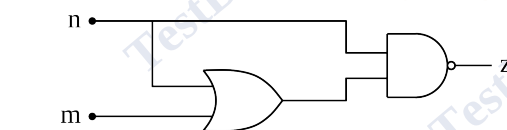
- | A | B | Y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |
- (1)
- | A | B | Y |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |
- (2)
- | A | B | Y |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |
- (3)
- | A | B | Y |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |
- (4)

Scan or tap for the full solution



Q.8 For the given logic gate circuit, which of the following is the correct truth table?

[JEE Main 2026 (Online) 23rd January Evening Shift]



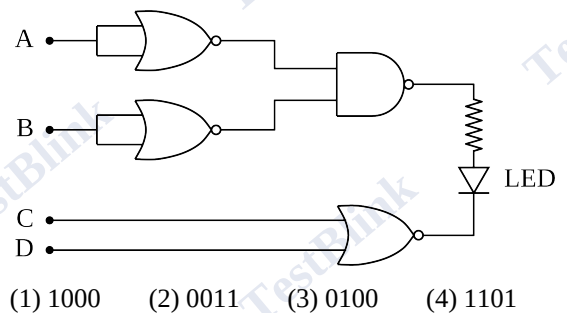
- | n | m | z |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 1 | 0 |
| 1 | 0 | 0 |
- (1)
- | n | m | z |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 1 | 1 |
| 1 | 0 | 0 |
- (2)
- | n | m | z |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 1 | 0 |
| 1 | 0 | 1 |
- (3)
- | n | m | z |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 1 | 0 |
| 1 | 0 | 0 |
- (4)

Scan or tap for the full solution



Q.9 Find the correct combination of A, B, C and D inputs which can cause the LED to glow.

[JEE Main 2026 (Online) 22nd January Morning Shift]



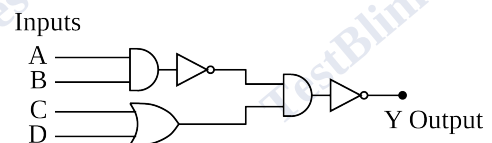
- (1) 1000 (2) 0011 (3) 0100 (4) 1101

Scan or tap for the full solution



Q.10 The correct truth table for the given input data of the following logic gate is :

[JEE Main 2026 (Online) 22nd January Evening Shift]



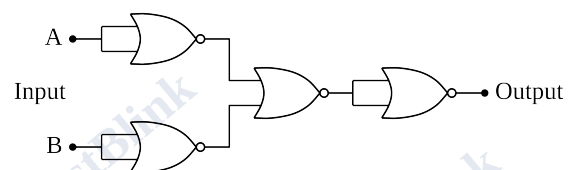
- | Inputs | | | | Output |
|--------|---|---|---|--------|
| A | B | C | D | Y |
| 1 | 1 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |
- (1)
- | Inputs | | | | Output |
|--------|---|---|---|--------|
| A | B | C | D | Y |
| 1 | 1 | 0 | 1 | 0 |
| 0 | 0 | 1 | 1 | 1 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |
- (2)
- | Inputs | | | | Output |
|--------|---|---|---|--------|
| A | B | C | D | Y |
| 1 | 1 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 |
- (3)
- | Inputs | | | | Output |
|--------|---|---|---|--------|
| A | B | C | D | Y |
| 1 | 1 | 0 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |
- (4)

Scan or tap for the full solution



Q.11 The given circuit works as :

[JEE Main 2026 (Online) 21st January Morning Shift]

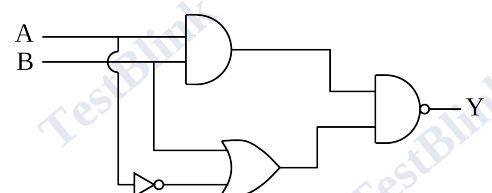


- (1) NOR gate (2) OR gate
(3) AND gate (4) NAND gate

Scan or tap for the full solution



Q.12 Consider the following logic circuit.



The output is $Y = 0$ when :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) A = 1 and B = 0 (2) A = 0 and B = 0
 (3) A = 1 and B = 1 (4) A = 0 and B = 1

Scan or tap for the full solution



Q.13 The Boolean expression $Y = A\bar{B}C + \bar{A}\bar{B}\bar{C}$ can be realised with which of the following gate configurations.

- A. One 3-input AND gate, 3 NOT gates and one 2-input OR gate, one 2-input AND gate
 B. One 3-input AND gate, 1 NOT gate, one 2-input NOR gate and one 2-input OR gate
 C. 3-input OR gate, 3 NOT gates and one 2-input AND gate

Choose the correct answer from the options given below: [JEE Main 2025 (Online) 4th April Morning Shift]

- (1) B, C Only (2) A, B, C Only
 (3) A, B Only (4) A, C Only

Scan or tap for the full solution



Q.14 Choose the correct logic circuit for the given truth table having inputs A and B.

[JEE Main 2025 (Online) 3rd April Morning Shift]

Inputs		Output
A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

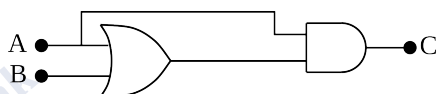
- (1)
- (2)
- (3)
- (4)

Scan or tap for the full solution



Q.15 The truth table corresponding to the circuit given below is:

[JEE Main 2025 (Online) 3rd April Evening Shift]



	A	B	C
	0	0	0
(1)	0	1	0
	1	0	1
	1	1	1
	A	B	C
	0	0	1
(3)	0	1	0
	1	0	0
	1	1	0

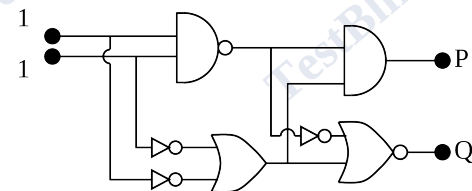
	A	B	C
	0	0	1
(2)	1	0	0
	0	1	0
	1	1	0
	A	B	C
	0	0	0
(4)	1	0	0
	0	1	0
	1	1	1

Scan or tap for the full solution



Q.16 In the digital circuit shown in the figure, for the given inputs the P and Q values are :

[JEE Main 2025 (Online) 2nd April Evening Shift]

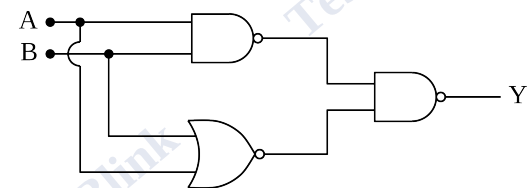


- (1) P = 0, Q = 1 (2) P = 1, Q = 0
 (3) P = 0, Q = 0 (4) P = 1, Q = 1

Scan or tap for the full solution



Q.17



For the circuit shown above, equivalent GATE is :

[JEE Main 2025 (Online) 29th January Morning Shift]

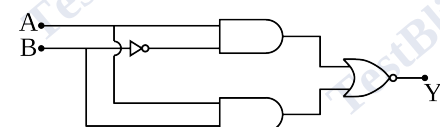
- (1) NOT gate (2) NAND gate
 (3) AND gate (4) OR gate

Scan or tap for the full solution



Q.18 Which of the following circuits has the same output as that of the given circuit?

[JEE Main 2025 (Online) 28th January Morning Shift]



- (1)
- (2)
- (3)
- (4)

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	3	3	1	4	1	1	1	4	1	4
Ques.	12	13	14	15	16	17	18				
Ans.	3	3	1	1	3	4	1				