# Complete the Truth tables, Boolean expression and circuit for the following circuits and write down the Boolean expression - Answers

|  |  |  |  |
| --- | --- | --- | --- |
|  | Circuit | Truth Table | Boolean Expression |
| 1 | E | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **A** | **B** | **E** | **C** | **D** | | 0 | 0 | 1 | 0 | 1 | | 0 | 1 | 1 | 1 | 0 | | 1 | 0 | 0 | 0 | 1 | | 1 | 1 | 0 | 0 | 1 | | E=NOT A  C= E AND B  D= NOT C  D = NOT (E AND B) Substitute in C  **D = NOT((NOT A) AND B)** Substitute in E |
| 2 |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **A** | **B** | **C** | **D** | **E** | | 0 | 0 | 0 | 1 | 1 | | 0 | 1 | 0 | 0 | 0 | | 1 | 0 | 0 | 1 | 1 | | 1 | 1 | 1 | 0 | 1 | | C = A AND B  D = NOT B  E= C OR B  **E = (A AND B) OR (NOT B)** |
| 3 |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **A** | **B** | **C** | **D** | **E** | **F** | | 0 | 0 | 0 | 1 | 0 | 1 | | 0 | 1 | 0 | 1 | 0 | 1 | | 1 | 0 | 0 | 1 | 0 | 1 | | 1 | 1 | 0 | 1 | 1 | 1 | | 0 | 0 | 1 | 0 | 0 | 0 | | 0 | 1 | 1 | 0 | 0 | 0 | | 1 | 0 | 1 | 0 | 0 | 0 | | 1 | 1 | 1 | 0 | 1 | 1 | | E = A AND B  D= NOT C  F = E OR D  **F = (A AND B) OR (NOT C)** |
| 4 |  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **A** | **B** | **C** | **D** | **E** | **F** | | 0 | 0 | 0 | 0 | 1 | 1 | | 0 | 1 | 0 | 0 | 1 | 1 | | 1 | 0 | 0 | 0 | 1 | 1 | | 1 | 1 | 0 | 1 | 0 | 0 | | 0 | 0 | 1 | 0 | 1 | 1 | | 0 | 1 | 1 | 0 | 1 | 1 | | 1 | 0 | 1 | 0 | 1 | 1 | | 1 | 1 | 1 | 1 | 0 | 1 | | D = A AND B  E = NOT D  F = E OR C  **F = NOT(A AND B) OR C** |
| 5 |  | |  |  |  |  |  | | --- | --- | --- | --- | --- | | **A** | **B** | **C** | **D** | **E** | | 0 | 0 | 0 | 0 | 1 | | 0 | 1 | 1 | 1 | 0 | | 1 | 0 | 1 | 1 | 0 | | 1 | 1 | 1 | 1 | 0 | | F = NOT((A OR B) OR B) |
| 6 |  | |  |  |  | | --- | --- | --- | | **A** | **B** | **Q** | | 0 | 0 | 0 | | 0 | 1 | 1 | | 1 | 0 | 1 | | 1 | 1 | 0 | | Q = (NOT A) XOR (NOT B) |
| 7 |  | |  |  |  | | --- | --- | --- | | **A** | **B** | **Q** | | 0 | 0 | 0 | | 0 | 1 | 1 | | 1 | 0 | 0 | | 1 | 1 | 0 | | (NOT A) AND B |