**Exercise 4: Introduction to Logic Circuit Design**

**SECTION A**

1. Identify the following gates:-



2. Draw the Truth Tables which describe relevant gates and display the output.

|  |  |  |
| --- | --- | --- |
| A | B | C |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| A | B | C |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| A | B | C |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| A | B | C |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
|  | A | B |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| A | B | C |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

3. Construct the following circuits, and fill-in the truth tables for them. Indicate which gate could be used to replace each circuit.



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A | B | C | D | E | F |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| J | K | L | M | N | P |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**SECTION B**

1. An **AND** gate can have only two inputs. (True/False)
2. If any input to an **OR** gate is 1, the output is 1. (True/False)
3. If all inputs to an **AND** gate are 1, the output is 0. (True/False)
4. When the input to an inverter is HIGH (1), the output is
5. HIGH or 1
6. LOW or 1
7. HIGH or 0
8. LOW or 0
9. An inverter performs an operation known as
10. Complementation
11. Assertion
12. Inversion
13. Both answers (a) and (c)
14. The output of an AND gate with inputs A, B, and C is a 1 (HIGH) when
15. A = 1, B = 1, C = 1
16. A = 1, B = 0, C = 1
17. A = 0, B = 0, C = 0
18. The output of an OR gate with inputs A, B, and C is a 1 (HIGH) when
19. A = 1, B = 1, C = 1
20. A = 0, B = 0, C = 1
21. A = 0, B = 0, C = 0
22. Answers (a), (b), and (c)
23. Only answers (a) and (b)