UGC NET 2018 :

Consider the vocabulary with only four propositions A,B,C and D. How many models are there for the following sentence ?

(¬ A ∨ ¬B ∨ ¬C ∨ ¬ D)

A) 8

B) 7

C) 15

D) 16

Solution:

We know there are total 2^4 = 16 cases.

As shown in below truth table, it won't satisfy the condition when A = B = C = D = 0.

S.No	A	B	C	D	(¬ A ∨ ¬B ∨ ¬C ∨ ¬ D)
1	0	0	0	0	0
2	0	0	0	1	1
3	0	0	1	0	1
4	0	0	1	1	1
5	0	1	0	0	1
6	0	1	0	1	1
7	0	1	1	0	1
8	0	1	1	1	1
9	1	0	0	0	1
10	1	0	0	1	1
11	1	0	1	0	1
12	1	0	1	1	1

13	1	1	0	0	1
14	1	1	0	1	1
15	1	1	1	0	1
16	1	1	1	1	1

So, from the given sentence false(0) occurs only if A, B, C and D are false(0) which occurs 1 time.
Required number of models = 16 – 1 = 15.

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