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 v ⊢B v ⊢C v ⊢ 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.

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S.No	A	В	С	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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