CS & IT





Discrete Mathematics

Set Theory

DPP 01 Discussion Notes



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TOPICS TO BE COVERED

01 Question

02 Discussion

Which of the following statements are true?



I.
$$\phi \in \phi$$

IV.
$$\phi \in \{\phi\}$$

Tov.
$$\phi \subset \{\phi\}$$
 of

I
$$\phi \in \phi$$
 False

I $\phi \in \phi$ False

The property take

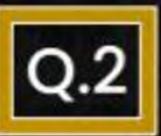
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The Employ

Th

$$\frac{1}{2^{0}} = 1$$

$$\frac{1}{2^{0}$$



If a set A has 63 proper subsets, then what is the cardinality of A?



A=
$$\{1,2,3\}$$
 : $2^{3}=8$

Subset: $\{0,51\}$, $\{23,53\}$, $\{1,23,51,3\}$, $\{2,33\}$

proper subset of A = element

A: 63 proper subset $2^{2}-1=4$
 $\{1,2,3...6\}$
 $\{1,2,3...6\}$

If a set A has 64 subsets of odd cardinality, then what is |A|? [MCQ no of elements in the subset must A= 51,2,3,4,53 Subset (1): \$ \$17, \$23, \$33, \$43, \$535 63 Subset (23. 2 51,23, 51,33 } : Even Subs-et (3): \$ \$1,2,33, \$1,2,43, \$1,2,5}-

$$2n-1 A = 5 n e lements$$

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$$2^{n-1} = \frac{64}{\text{odd}} \text{ card. Subsets}$$

$$3^{n-1} = 26$$

$$3^{n-1} = 6$$

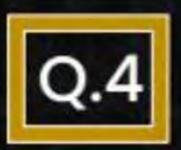
$$3^{n-1} = 6$$

$$3^{n-1} = 6$$

$$3^{n-1} = 6$$

$$3^{n-1} = 7$$

$$3^{n-1} = 7$$



How many subset of {1, 2, 3, ..., 11} contain at-least one even integer?



one even integer?

A:
$$\{1, 2, 3, \dots - 11\}$$

Subset $\{1, 2, 3, \dots - 11\}$

Method: Complement method

Total subsets: 2^{11}

Odd Values $\{1, 3, 5, 7, 9, 11\}$: 6 elements

Subsets: 2^{6} : (64) Subsets



Subset with atleast one even: 2 - 64 Method? Set. 22, 4, 6, 8, 105 No. of SBrbsels. 25



A:
$$\{1, 2, 3, 4\}$$

Set = $\{2, 4\}$
 $\{2, 4, 5, 4\}$
 $\{2, 4, 5, 5\}$
 $\{2, 13, 5, 4\}$
 $\{2, 13, 5, 4\}$
 $\{2, 13, 5, 4\}$
 $\{2, 13, 5, 5\}$
 $\{2, 13, 5, 5\}$
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 $\{2, 13, 5, 5\}$



Let A = {1, 2, 3, 4, 5, 7, 8, 10, 11, 14, 17, 18}



How many subsets of A contain six elements?

$$A = 3(1,2,3)$$
50b5ets: $5(0,313,523,534,51,23,51,33)$

$$2 elements: 3 subsets 2:33, 51:2:533$$

$$31 = 3 * 2 * 1 = 3$$

$$(1,2) 51:33, 52:33$$



Total number of elements: 12 elements
Sclect 6 elements for subsets.

Total no. of Subsets (6): 12 c = 121 6161

12×11×10×9+8+7×61

6/ × 6×5×4×3×2



Let $A = \{2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15\}$

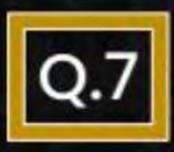


How many six-elements subsets of A contain four even integers and two odd integers?

Subset & with 6 elements: 12c

Even number in sets 52,4,6,8,10,12}7

ODD number in sets 55,7,9, N, 13,15?



Let A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12} 12 clements

[NAT]

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How many subsets of A contain only odd integers?



