

Easy

Assistant Engineer (Electrical), Class 2025

Building Department

What is the maximum possible range of bit-count specifically in n-bit binary counter consisting of n number of flip-flops?

A

0 to $2n$

B

0 to $2n + 1$

C

0 to $2^n - 1$

Correct

D

0 to $2^{n+1/2}$

Correct Answer: C

Full Detailed Explanation

Concept & Reasoning Each flip-flop stores one binary bit, so n flip-flops form 2^n unique bit patterns. A 4-bit counter, for example, runs from 0000 (0) to 1111 (15), i.e. 0 to

$2^4 - 1$. This generalizes directly to n bits. How to Solve It in the Exam n bits $\rightarrow 2^n$ states

maximum numeric count $2^n - 1$. Important Exam Point Separate 'number of states' from 'largest count'. Related Revision Path This question sits in the revision path Digital Electronics

Sequential Logic $\rightarrow$ Counters .

Open live question on website:

<https://sarkariresultout.com/pyq/question/gpsc-ae-electrical-q157-n-bit-binary-counter-range/>