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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | | 0 | 0 | 1 | 1 | 1 |  | 1 | 1 | 1 | 1 | 2 | | 0 | 0 | 0 | 0 | 1 | = | 0 | 1 | 0 | 1 | 0 | | 1 | 0 | 1 | 0 | 1 |  | 0 | 2 | 0 | 1 | 2 | | 0 | 1 | 0 | 1 | 0 |  | 1 | 0 | 2 | 1 | 2 |   **1. Graph Theory**  To find the number of  paths of length 2, add  the entries in the square  of the adjacency  matrix. The sum is 24. | **1.** 24 |
| **2. Graph Theory**    The cycles are: ABDA, ABDCA, ADCA, ADA, BDB, and BDCB. | **2.** 6 |
| **3. Digital Electronics**  The circuit translates to:  =  =  =  =  =  =  Note: It would have been fewer steps if the first term had been  simplified first. | **3.** |
| **4. Digital Electronics**  The circuit translates to:  =  =  = .  This is FALSE when all three terms are 0, so .  The corresponding ordered triple is (1, 1, 1). | **4.** (1, 1, 1) |
| **5. Assembly Language**  This program converts a base ten number into a base 16 number by  repeated division. The integral remainders are outputted.  421310 =107516 The sum of the digits outputted is 13. | **5.** 13 |