
QUESTION 1

In designing a **2-level** design that will accommodate factors A, B, C, D, E, F, and interactions AxB, AxD, Dx E, Dx F
What is the minimum number of columns needed?

- a. 8
 - b. 9
 - c. 10
 - d. 11
-

QUESTION 2

For a 2-level design that will accommodate factors A, B, C, D, E, F, and interactions AxB, AxD, Dx E, Dx F
Which Taguchi design would be most appropriate?

- a. L4
 - b. L8
 - c. L16
 - d. L27
-

QUESTION 3

The total number of tests required to run a Full Factorial design utilizing 13 factors at 3 levels is...

- a. 9
 - b. 27
 - c. 2197
 - d. 1,594,323
-

QUESTION 4

The reason you can find optimal factor levels from only a fraction of the total combinations is because:

- a. The columns are orthogonal.
 - b. The factors are binomial.
 - c. The columns are randomized to eliminate bias.
-

QUESTION 5

Once a list of factors to be used in an experiment are created, they must be classified as either:

- a. Highly likely or highly unlikely
 - b. Controllable or Noise
 - c. Important or Unimportant
 - d. Controllable or Uncontrollable
-

QUESTION 6

The linear graph for analyzing the AxB, AxC, and BxC interactions would be shaped like a...

- a. straight line
- b. rectangle
- c. pentastar
- d. triangle

QUESTION 7

What 2-level Taguchi design needs to be used for the following:

Factors A, B, C, D, E and Interactions AxB, AxC, AxD, AxE, BxC, BxD, BxE, CxD, CxE, DxE

- a. L4
 - b. L8
 - c. L9
 - d. L16
-

QUESTION 8

If we wanted to use a **3-level** design for the previous set of factors and interactions (A, B, C, D, E, AxB, AxC, AxD, AxE, BxC, BxD, BxE, CxD, CxE, DxE), how many **columns** minimum would be required (based on the L^n formula)?

- a. 13
 - b. 18
 - c. 25
 - d. 27
-

QUESTION 9

When analyzing the effects of noise factors, we typically will set the optimal level for each noise factor studied after the experiment is over.

- True
- False

QUESTION 10

The statistic developed by Taguchi used in Taguchi analysis is the...

- a. Decibel
 - b. Signal to Noise ratio
 - c. Mean Variance quotient
 - d. RMS voltage
-

QUESTION 11

When determining optimal levels for factors using the Signal to Noise (S/N) ratio:

- a. We always choose the level with the highest average S/N ratio.
 - b. We choose the level with the highest S/N ratio only for bigger the better experiments.
 - c. We choose the level with the lowest S/N ratio if we are trying to minimize an output.
-

QUESTION 12

What are the typical objectives of an experiment? (Select all that apply)

- a. Maximize
 - b. Minimize
 - c. Target to a Nominal Value
 - d. Reduce variation
-

QUESTION 13

In designing a Taguchi experiment with both controllable and noise factors, we would carefully put the noise factors into the same array as the controllable factors in order to analyze them independently.

- True
- False

QUESTION 14

In considering an experiment with both controllable and noise factors...

- a. The controllable factors and noise factors are put into a single array.
 - b. The noise factors are put into an inner array and the controllable factors are put into an outer array.
 - c. The controllable and noise factors can be put into either array, as long as they are analyzed appropriately.
 - d. The controllable factors are put into an Inner array while the Noise factors are put into an Outer array.
-

QUESTION 15

The following array is a portion of an L8 array from an experiment measuring several factors and their interactions at 2 levels.

	A	B	AB	D	...
No.	1	2	3	4	...
1	1	1	1	1	...
2	1	1	1	2	...
3	1	2	2	1	...
4	1	2	2	2	...
5	2	1	2	1	...
6	2	1	2	2	...
7	2	2	1	1	...
8	2	2	1	2	...

WHICH RUN NUMBERS WOULD BE USED IN THE CALCULATING THE MAIN EFFECT OF FACTOR "A" AT LEVEL 1?

- a. Runs 1, 2, 3 and 4
- b. Runs 5, 6, 7 and 8
- c. Runs 1, 3, 5 and 7
- d. Runs 2, 4, 6 and 8

QUESTION 16

Using the same L8 array from the previous problem, an experiment measuring several factors and their interactions at 2 levels.

	A	B	AB	D	...
No.	1	2	3	4	...
1	1	1	1	1	...
2	1	1	1	2	...
3	1	2	2	1	...
4	1	2	2	2	...
5	2	1	2	1	...
6	2	1	2	2	...
7	2	2	1	1	...
8	2	2	1	2	...

TO CALCULATE THE AXB INTERACTION EFFECT AT **A1B2** WHICH RUN NUMBERS WOULD BE AVERAGED?

- No. 1, 2, 3 and 4
 - No. 1 and 2
 - No. 3 & 4
 - No. 5 & 6
-

QUESTION 17

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Using the same L8 array from the previous problem, an experiment measuring several factors and their interactions at 2 levels.

	A	B	AB	D	...
No.	1	2	3	4	...
1	1	1	1	1	...
2	1	1	1	2	...
3	1	2	2	1	...
4	1	2	2	2	...
5	2	1	2	1	...
6	2	1	2	2	...
7	2	2	1	1	...
8	2	2	1	2	...

TO CALCULATE THE AXB INTERACTION EFFECT AT **A1B2** WHICH RUN NUMBERS WOULD BE AVERAGED?

- No. 1, 2, 3 and 4
- No. 1 and 2
- No. 3 & 4
- No. 5 & 6

QUESTION 18

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Using the following L8 array (2 levels):

	A	B	AB	D	E	BD	
No.	1	2	3	4	5	6	7
1	1	1	1	1	1	1	1
2	1	1	1	2	2	2	2
3	1	2	2	1	1	2	2
4	1	2	2	2	2	1	1
5	2	1	2	1	2	1	2
6	2	1	2	2	1	2	1
7	2	2	1	1	2	2	1
8	2	2	1	2	1	1	2

TO CALCULATE THE BXD INTERACTION EFFECT AT LEVELS **B2D2** WHICH RUN NUMBERS WOULD BE AVERAGED?

- No. 1 and 4
 - No. 1 and 2
 - No. 5 & 7
 - No. 4 & 8
-

QUESTION 19

In a 2-level design each interaction requires _____ column(s).

- a. 1
 - b. 2
 - c. 3
 - d. 4
-

QUESTION 20

In a 3-level design, each interaction requires _____ columns.

- a. 1
 - b. 2
 - c. 3
 - d. 4
-

QUESTION 21

In Nominal-the-Best experiments it is important to identify two types of factors, 1) Signal factors and 2) _____

- a. Factors that affect **both** the mean and the variation.
 - b. Factors that affect **neither** the mean nor the variation.
 - c. Factors that affect the variation only.
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QUESTION 22

The ideal signal factor will affect the 1. _____ but not the 2. _____

QUESTION 23

After determining the optimal Factor levels for the controllable factors from your experiment, the next step is to...

- a. Celebrate with your team!
 - b. Tell your boss you deserve a raise.
 - c. Check to see if the you ran the optimal combination during your experiment and if not, RUN IT!
 - d. Assume you're good to go and write a report.
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QUESTION 24

When you run the optimal factor/level combination you should expect the S/N ratio to be:

- a. Higher than any of the S/N ratios calculated during the experiment.
 - b. Lower than any of the S/N ratios if the experiment was a smaller the better type.
 - c. Somewhere between the highest and the lowest S/N ratio of the experiment.
 - d. Impossible to predict
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QUESTION 25

According to your Professor, the best strategy and approach to choosing factors, levels and interactions is to:
(CHOOSE ALL THAT ARE APPROPRIATE)

- a. Choose fewer factors at more levels
- b. Choose more factors at fewer levels
- c. Love interactions (put in as many as you can dream of!)
- d. Hate interactions, but allow for those you think might really be important.