1A.

The null hypothesis is that the level of sugar in the drinks is equal to 10 grams as per the recipe, while the Alternative hypothesis is that the level of sugar in the drinks is different from 10 grams.

Mu = 10 (Alternate): mu != 10

Where mu is the population mean sugar level in the drinks.

1B.

A 2-sample t-test with the same variances is the most appropriate because we are comparing the mean sugar level of the sample to the known value of 10 grams, I think.

1C.

```
> Drink_sugar=c(9.976959, 10.012098, 9.963002, 9.998574, 10.002431, 10.036959,
0.014752, 9.985491, 10.026681,9.981070, 10.011058, 9.958206, 10.047110,
9.931327, 9.980533, 9.982266, 9.956010, 9.992339, 9.957293, 9.907988, 9.983450,
10.018341, 9.979281, 9.931443, 10.019777)

> t.test(Drink_sugar, mu=10)
```

```
      One Sample t-test

data:  Drink_sugar

t = -1.0375, df = 24, p-value = 0.3098

alternative hypothesis: true mean is not equal to 10

95 percent confidence interval:

  8.762958 10.409397

sample estimates:

mean of x

 9.586178
```

p-value = 0.3098

This is less than 0.05, so we reject the null hypothesis

2A.

The best-test to address this question is a paired two-sample t-test since the data comes from the same source, and we are comparing the mean sales before and after the discount.

2B.

The Null hypothesis is that there is no difference in the average sales before and after the discount program. The Alternative hypothesis is that there is a statistical difference in the average sales before and after the discount program.

Null hypothesis: mu_before = mu_after

Alternative hypothesis: mu_before != mu_after

Where mu_before is the population mean of daily sales before the discount program, and mu_after is the population mean of daily sales after the discount program.

2C.

```
> Daily_Sale_Before_Discount_Program = c(49971.98, 49988.49, 50077.94,
50003.53, 50006.46, 50085.75, 50023.05)

> Daily_Sale_After_Discount_Program = c(50011.75, 50040.66, 50052.72, 50136.20,
50092.99, 50095.04, 50080.53)

>

>

> t.test(Daily_Sale_Before_Discount_Program, Daily_Sale_After_Discount_Program,
paired = TRUE)


      Paired t-test
```

```
data:  Daily_Sale_Before_Discount_Program and Daily_Sale_After_Discount_Program

t = -2.6103, df = 6, p-value = 0.04011

alternative hypothesis: true mean difference is not equal to 0

95 percent confidence interval:

 -97.615451  -3.153121

sample estimates:

mean difference

      -50.38429
```

Since the pValue is `p-value = 0.04011 we can safely reject the null hypothesis`