**Sampling Distributions and Central Limit Theorem**

1)



i) Here, from the above “fig-C” follows normal.

ii) Here, from the above “fig-B” have a bimodal distribution gap in the spacing of adjacent data

values.

iii) Here, from the above “fig-A,C,D” are skewed.

iv) The outliers are at only one side from the above “fig-A”.

2)

i) False – A sampling distribution is a probability distribution of a statistic obtained from a larger number of samples drawn from a specific population.

In this case samples contain 25 packages and the larger number of samples contain for each such 25 packages taken into different samples (25+25+…and so on).

The mean for these samples is 22lbs and standard deviation of 5lbs which means each individual package is having a weight varying between + or – 5lbs with respect to mean(22lbs).

Hence it is invalid to take a weight of individual packages and confirm that it follows normal distribution.

The sample Central Limit Theorem states that the sampling distribution of the samples mean

approaches normal distribution as the size is large enough.

ii) As Standard Error (SE) = sample standard deviation / square root of (number of sample)

SE = / (25)^1/2 SE = 1

3) = 50, standard error (SE)=s/sqrt(n)

= 40/sqrt(100)

= 40/10 = 4

This distribution is normally distributed because of Central Limit Theorem.

N=100 makes n>30

The value of P(45<x<55) is “0.7887”

Subtracting 1 from that value gives 1-0.7887= 0.2113 that converts to 21.1%.

4) for 5%, t-value is +/-1.96 t-value = (x\_bar – meu)/(sample\_standard\_deviation/sqrt(n))

So,

1.96=(5)/(sqrt(n)/40) sqrt(n)= (40\*t-value)/(5)

n = 248(it is near to 250)

So, n = 250

5) Standard error = sigma / (n)^0.5

= standard deviation / (sample size)^0.5

= 120 / (40000)^0.5

= 0.60