Course Code: 207 QUA **First Mid Exam**	**Name:** **ID:** **Serial Number:** **Section:**

Question (1) Select the correct statement about the sampling distribution of sample mean $\overline{X}$:

(A) If the population distribution is non-normal, the sampling distribution of $\overline{X}$ will be approximately normal by Central limit theorem.
(B) If the population distribution is normal, the sampling distribution of $\overline{X}$ will be exactly normal.
(C) None of the above
(D) Both A & B.

Question (2): The mean diameter of marbles manufactured at particular toy factory is 0.850 CM with a standard deviation of 0.010 CM, then the probability of selecting a random sample of 100 marbles that has a mean diameter greater than 0.851 CM equals:

(A) 0.3413	**(B)** 0.1587	**(C)**0.1352	**(D)**0.2113

Question (3): The standard error of the sample mean is...

(A) The standard deviation of the sampling distribution of the Sample means.
(B) The standard deviation of the sampling distribution of the proportion.
(C) The standard deviation of the population.
(D) The variance of the sampling distribution of the sample mean

Question (4): A population is estimated to have a standard deviation of 10. If a 90 percent confidence interval is used and an interval of ± 2 is desired .Then the required sample size for estimation of the population mean equals:

(A) 30	(B) 28	(C) 75	(D) 68

Question (5): As the sample size increases, the standard deviation of the sampling distribution of the sample proportion...

(A) Increases	**(B)** Stay the same
(C) Decreases	**(D)** None of the above

If $n=36$, $\bar{x}=16$, $S^2=16$.

Answer question from 6 to 8:

Question (6): The correct formula that used to estimate a 90% confidence interval for μ , the true population mean is:

(A) $\bar{X} \pm Z_{\frac{\alpha}{2}} \frac{S}{\sqrt{n}}$	**(B)** $\bar{X} \pm Z_{\frac{\alpha}{2}} \frac{\sigma^2}{\sqrt{n}}$
(C) $\mu \pm t_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$	**(D)** $\bar{X} \pm t_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$

Question (7): The upper limit of the confidence interval for μ is

(A) 23	**(B)** 17.1	**(C)** 14.9	**(D)** 12

Question (8): The lower limit of the confidence interval for μ is

(A) 23	**(B)** 17.1	**(C)** 14.9	**(D)** 12

Question (9): The sample size is 12 and level of confidence is 95% , then the value of t is :

(A) 2.201	**(B)** 3.23	**(C)** 1.729	**(D)** 3.499

Question (10): The incorrect statement about t distribution is:

(A) It is positively skewed.
(B) It is continuous distribution.
(C) It has a mean of zero.
(D) there is a family of t distributions

Question (11): P (-1.6<Z<0.8) is:

(A) 0.4452	**(B)** 0.2881	**(C)** 0.7333	**(D)** 0.1571

A population distributed normally with size 20, and standard deviation of 6, simple random samples with size 2 were selected **with replacement.**

Answer the questions from 12 to 14:

Question (12): The number of possible samples equal:

(A) 100	**(B)** 400	**(C)** 200	**(D)** 300

Question (13): The probability of selecting any of the possible simple random samples is:

(A) 0.0025	**(B)** 0.2000	**(C)** 0.2567	**(D)** 0.1571

Question (14): Standard error of the sampling distribution is:

(A) 3.2	**(B)** 4.24	**(C)** 2.5	**(D)** 1.571

Barnard College is a private institution for women located in New York City. A random sample of 50 girls was taken. The sample mean of grade point averages was 3. At neighboring Columbia College a sample of 100 men had an average of 2.5. Assume all sampling is normal and Barnard's standard deviation is 0.2, while Columbia's is 0.5 **. Answer the questions from 15 to 17:**

Question (15): To construct 99% Confidence interval for difference between means The Critical Value of Z equal**:**

(A) 1.96	**(B)** 2.575	**(C)** 1.645	**(D)** 1.571

Question (16): The upper limit of the confidence interval for $\mu_1 - \mu_2$ is

(A).262	**(B)**.575	**(C)** 0.648	**(D)** 0.352

Question (17): The lower limit of the confidence interval for $\mu_1 - \mu_2$ is

(A).262	**(B)**.575	**(C)** 0.648	**(D)** 0.352

Two independent samples were taken from two normally distributed populations yield: $n_1 = 13, S_1 = 1.82$ **and** $n_2 = 10,\ S_2 = 1.8$

Answer questions 18 to 20.

Question 18

The formula that we use to determine $(1-\alpha)$ **confidence interval for the ratio of two population variances (normal case)**

(A) $\frac{S_2^2}{S_1^2} F_{v_1,v_2,\frac{\alpha}{2}} \le \frac{\sigma_2^2}{\sigma_1^2} \le \frac{S_2^2}{S_1^2} F_{v_1,v_2,1-\frac{\alpha}{2}}$	**(B)** $\frac{\sigma_1^2}{\sigma_2^2} F_{v_1,v_2,1-\frac{\alpha}{2}} \le \frac{S_2^2}{S_1^2} \le \frac{\sigma_1^2}{\sigma_2^2} F_{v_1,v_2,\frac{\alpha}{2}}$
(C) $\frac{S_1^2}{S_2^2} F_{v_1,v_2,\frac{\alpha}{2}} \le \frac{\sigma_2^2}{\sigma_1^2} \le \frac{S_1^2}{S_2^2} F_{v_1,v_2,1-\frac{\alpha}{2}}$	**(D)** $\frac{S_2^2}{S_1^2} F_{v_1,v_2,1-\frac{\alpha}{2}} \le \frac{\sigma_2^2}{\sigma_1^2} \le \frac{S_2^2}{S_1^2} F_{v_1,v_2,\frac{\alpha}{2}}$

Question 19

In the 98% confidence interval for the ratio of two population variances, the upper limit will be:

(A) 3.742	**(B) 4.998**	**(C) 5.01**	**(D) 2.97**

Question 20

In the 98% confidence interval for the ratio of two population variances, the lower limit will be:

(A) 0.35	**(B) 0.46**	**(C) 0.08**	**(D) 0.22**

With our best wishes