Suppose Z has a standard normal distribution, find :
(i) $P(Z \geq 1.36)$
(ii) P $(1.2 < Z < 2.5)$

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If X is N (4,100) , find :
(i) P $(X > 5)$
(ii) P $(4 < X < 20)$
(iii) the value of k such that P $(X \geq k) = 0.1515$

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In a sample of 400 patients living in Saudi Arabia who gut burnt, the mean period of treatment was 3.45 weeks with variance 2.25 (weeks)^2 . If μ is the true mean period of treatments of all patients who get burnt in Saudi Arabia, find :
(i) a point estimate of μ .
(ii) a 99% confidence interval of μ .

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In a sample of 368 children from Riyadh , 46 have not received vaccination .
(i) Find a point estimate of the children in Riyadh who have not received vaccination (P) .
(ii) Obtain 95% confidence interval for P .

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Fill in the blanks :
(1) If Z has standard normal distribution and P $(Z \geq k) = 0.25$, then k = ...
(2) If $X \sim N\ (\ \mu\ , 16\ )$ and n = 4 , then Var $(\bar{X})$ = ...

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In a sample of 49 Saudis living in villas the mean vitamin D level was 16 with a variance of 12 . Assume that the distribution is normal, the 95% confidence interval for the population mean is ?

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If $x_1, x_2, \ldots \ldots, x_n$ are random sample from normal population with finite mean μ and variance σ^2 , then the sampling distribution for the sample mean is ?

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The statistical inference divided into two types ?

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The random variable X has the normal distribution with mean 4.8 and standard deviation 0.3 .

(a) The probability P $[X > 5.4\ ] =$

(i) 0.2743 (ii) 0.0228 (iii) 0.9772 (iv) None of these

(b) Find the probability $P\ [4.2 \leq X \leq 5.4] =$

(i) 0.0228 (ii) 0.7257 (iii) 0.95447 (iv) None of these

****

In a study of the effects of a diuretic, 30 healthy adult males were given single doses of the drug and were closely monitored to determine their urinary output over the next 24 hours. The sample mean urinary output was 3300 milliliters and sample standard deviation was 500 milliliters. The population mean of urinary output is μ , 95% confidence interval for μ is ?

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The average life of a certain battery is 5 years, with a standard deviation of 1 year. Assume that the life of the battery approximately follows a normal distribution .

1) The sample mean $(\bar{X})$ of a random sample of 5 batteries selected from this product has a mean $E(\bar{X}) = \mu_{\bar{X}}$ equal to :

(A) 0.2 (B) 5 (C) 3 (D) None of these

2) The variance *Var* $(\bar{X}) = \ \mu\frac{2}{X}$ of the sample mean $(\bar{X})$ of a random sample of 5 batteries selected from this product is equal :

(A) 0.2 (B) 5 (C) 3 (D) None of these

3) The probability that the average life of a random sample of size 16 of such batteries will be between 4.5 and 5.4 years is :

(A) 0.1039 (B) 0.2135 (C) 0.7865 (D) None of these

4) The probability that the average life of a random sample of size 16 of such batteries will be less than 5.5 years is :

(A) 0.9772 (B) 0.0228 (C) 0.9223 (D) None of these

5) The probability that the average life of a random sample of size 16 of such batteries will be more than 4.75 years is :

(A) 0.8413 (B) 0.1587 (C) 0.9452 (D) None of these

6) If $P(\bar{X} > a\ ) = 0.1492$ where $\bar{X}$ represents the sample mean for a random sample of size 9 of such batteries, then the numerical value of a is :

(A) 4.653 (B) 6.5 (C) 5.347 (D) None of these

****

Suppose that 20% of the students in a certain university smoke cigarettes. A random sample of 5 students is taken from this university . let $\hat{P}$ be the proportion of smokers in the sample .

(1) Find $E\left(\hat{P}\right) = \mu_{\hat{P}}$, the mean $\hat{P}$.

(2) Find $Var\left(\hat{P}\right) = \sigma_{\hat{P}}^2$, the variance of $\hat{P}$.

(3) Find an approximate distribution of $\hat{P}$.

(4) Find $P(\hat{p} > 0.25)$.

****

Suppose that we are interested in making some statistical inferences about the mean μ , of a normal population with standard deviation $\sigma = 2.0$. Suppose that a random sample of size $n = 49$ from this population gave a sample mean $\bar{X} = 4.5$.

(1) The distribution of $\bar{X}$ is :
(A) N(0,1) (B) t(48) (C) N(μ , 0.2857) (D) N(μ , 2.0) (E) N(μ , 0.3333)

(2) A good point estimate of μ is :
(A) 4.50 (B) 2.00 (C) 2.50 (D) 7.00 (E) 1.125

(3) The standard error of $\bar{X}$ is :
(A) 0.0816 (B) 2.0 (C) 0.0408 (D) 0.5714 (E) 0.2857

(4) A 95% confidence interval for μ is :
(A) (3.44,5.56) (B) (3.34,5.66) (C) (3.54,5.46) (D) (3.94,5.06) (E) (3.04,5.96)

(5) If the upper confidence limit of a confidence interval is 5.2, then the lower confidence limit is :
(A) 3.6 (B) 3.8 (C) 4.0 (D) 3.5 (E) 4.1

(6) The confidence level of the confidence interval (3.88 , 5.12) is :
(A) 90.74% (B) 95.74% (C) 97.74% (D) 94.74% (E) 92.74%

(7) If we use $\bar{X}$ to estimate μ , then we are 95% confident that our estimation error will not exceed :
(A) e=0.50 (B) E=0.59 (C) e=0.58 (D) e=0.56 (E) e=0.51

(8) If we want to be 95% confident that the estimation error will not exceed e=0.1 when we use $\bar{X}$ to estimate μ , then the sample size n must be equal to :
(A) 1529 (B) 1531 (C) 1537 (D) 1534 (E) 1530

****

Two random samples were independently selected from two normal populations with equal variances. The results are summarized as follows :

	First Sample	Second Sample
Sample size (n)	12	14
Sample mean ($\bar{X}$)	10.5	10.0
Sample variance (S^2)	4	5

Let μ_1 and μ_2 be the true means of the first and second populations , respectively .

1. Find a point estimate for μ_1 - μ_2 ….
2. Find 95% confidence interval for μ_1 - μ_2 ….

****

A survey of 500 students from a college of a science shows that 275 students own computers. In another independent survey of 400 students from a college of engineering shows that 240 students own computers .

(a) a 99% confidence interval for the true proportion of college of science's student who own computers is :

(A) $-0.59 \leq p_1 \leq 0.71$ (B) $0.49 \leq p_1 \leq 0.61$
(C) $2.49 \leq p_1 \leq 6.61$ (D) $0.3 \leq p_1 \leq 0.7$

(b) a 95% confidence interval for the difference between the proportions of students owning computers in the two colleges is :

(A) $0.015 \leq p_1 - p_2 \leq 0.215$ (B) $-0.515 \leq p_1 - p_2 \leq 0.215$
(C) $-0.450 \leq p_1 - p_2 \leq -0.015$ (D) $-0.115 \leq p_1 - p_2 \leq 0.015$

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