**Question 1**

A recent study demonstrated that 25% of Indiana men are red/green color blind. Which of the following interpretation is most accurate?

Group of answer choices

A)In a group of randomly selected 100 people, 25 will be color blind.

B)In a group of randomly selected 1000 people, the fraction who are color blind will be very close to 250/1000.

C)In a group of randomly selected 20 Indiana men, 5 will be color blind.

D)In a group of randomly selected 200 Indiana men, the proportion who are color blind will be very close to 50/200.

E)Roughly one out of every 4 Indiana women is color blind.

**Question 2**

You select two cards from a deck of 52 cards and observe the color of each (26 cards in the deck are red and 26 are black). Write down the sample space for the possible outcomes of the variable. {\_\_} (Do not use abbreviation)

**Question 3**

The Centers for Disease Control and Prevention provides the breakdown of sources of infection leading to hepatitis C in Americans (table).  What is the probability that the source of infection for a person with hepatitis C is either intravenous drug use or a transfusion?

|  |  |
| --- | --- |
| Source of Infection | Probability |
| Intravenous drug use | 0.60 |
| Unprotected sex | 0.15 |
| Transfusion | 0.10 |
| Occupational | 0.04 |
| Occupational | 0.11 |

Group of answer choices

A)0.06

B)0.60

C)0.70

D)0.10

E)0.64

**Question 4**

If there is 0.05 probability that a child in Houston gets the flu and a 0.50 probability that a child in Chicago gets the flu, what is the probability that both will get the flu?

Group of answer choices

A)0.500

B)0.450

C)0.050

D)0.550

E)0.025

**Question 5**

The following risks are associated with tendon surgery are: infection (4%), repair fails (12%), both infection and repair fails (1%). What percent of tendon surgeries fail or result in infection? \_\_%

**Question 6**

Suppose that a medical test has a 90% chance of detecting a disease if the person has it (i.e., 90% sensitivity) and a 85% chance of correctly indicating that the disease is absent if the person really does not have it (i.e., 85% specificity). Suppose that 20% of the population has the disease. What is the probability that a randomly chosen person will test positive? \_\_

**Question 7**

The “bell” of a normal curve is approximately \_\_\_\_\_\_\_ standard deviations wide.

**Question 8**

Scientists discovered a new group of proteins in an animal species. They found that the distribution of the number of amino acids these proteins were made of was approximately Normal, with mean 270 and standard deviation 60. Approximately what percent of these new proteins will be more than 390 amino acids long? \_\_%

**Question 9**

We can use a Normal distribution to model the length of gestation for pregnant women. The model has a mean of 290 days and a standard deviation of 20 days. What is the *z*-score for a woman with a gestation period of 275 days? \_\_

**Question 10**

If we repeatedly take samples of *n* = 80 persons and calculate the proportion with red/green colorblindness, what is the calculated proportions?

Group of answer choices

A)It will decrease with each new sample.

B)It will vary from sample to sample.

C)There is not enough information.

D)It will increase with each new sample.

E)It should remain the same from sample to sample.

**Question 11**

If the height of college students is Normally distributed with a mean of 70 inches and a standard deviation of 5 inches, then what will the sampling distribution for the average height of 25 randomly chosen college student be?

Group of answer choices

A)It will be approximately Normal, with a mean of 70 inches and a standard deviation of 1 inch.

B)It will be abnormal, with unpredictable mean and standard deviation.

C)It will be exactly Normal, with a mean of 64 inches and a standard deviation of 3 inches.

D)It will be exactly Normal, with a mean of 70 inches and a standard deviation of 1 inch.

E)It will be approximately Normal, with a mean of 70 inches and a standard deviation of 5 inches.

**Question 12**

The proportion of baby boys born in the United States is equal to 0.512. Draw two histograms to represent proportions of boys in

(a) the whole U.S. population and

(b) repeated samples of newborn babies in the United States.

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**Question 13**

If a 95% confidence interval for the mean head circumference for adults, based on the results of measuring head circumference for 30 adults, is (21.18, 23.42) inches, what is the margin of error? \_\_ inches.

**Question 14**

The percent body fat in a random sample of 49 men aged 20 to 39 has a sample mean of 16.39. Assume that percent body fat follows a Normal distribution, with a standard deviation of 8.26. Find a 95% confidence interval for the mean percent body fat in all men aged 20 to 39, from \_  \_ to \_  \_.

**Question 15**

Heights of 1-year-old babies are Normally distributed, with mean 29.5 inches and standard deviation of 1.6 inches. A company claims that taking 400 mg of vitamin C makes babies taller. In a random sample of 100 babies who were given 400 mg vitamin C daily from birth to 1 year, the mean height was 29.7 inches. Assume the standard deviation remains the same. Is this evidence for the company’s claim? To make this determination, calculate and interpret the p-value for the appropriate test. P-value=\_  \_. Interpretation:\_  \_

**Question 16**

Arsenic is a compound that occurs naturally in very low concentrations. Arsenic blood concentrations in healthy individuals are Normally distributed, with a mean of 3.5 mg/dl and a standard deviation of 1.6 mg/dl. What sample size is required to be able to construct a 95% confidence interval to within ± 0.4 mg/dl of the population mean? \_\_

**Question 17**

If the critical level is 0.95, the power = 0.90 for a hypothesis test, what are the probabilities of making a Type I error = \_  , and Type II error = \_  ?

**Question 18**

A research neurologist is testing the effect of a drug on response time in adults. The mean response time for adults not injected with the drug is 0.5 seconds. The neurologist wishes to test whether the response time for adults injected with the drug differs from 0.5 seconds. The neurologist sets the level of significance to 0.05. If the true mean of injected group is 0.8 and the power of this test is 0.90. Describe the null hypothesis \_  \_ and alternate hypothesis \_  \_. Interpret type I error \_  \_ and type II error \_  \_.