

Econ 312: Practice Questions #1

1.The probability of an event A or B ($Pr(A \text{ or } B)$) to occur equals

- a. $Pr(A) \times Pr(B)$
- b. $Pr(A) + Pr(B)$ if A and B are mutually exclusive
- c. $\frac{Pr(A)}{Pr(B)}$
- d. $Pr(A) + Pr(B)$ even if A and B are not mutually exclusive.

Answer: b

2.The cumulative probability distribution shows the probability

- a. that a random variable is less than or equal to a particular value.
- b. of two or more events occurring at once.
- c. of all possible events occurring.
- d. that a random variable takes on a particular value given that another event has happened.

Answer: a

3.The expected value of a discrete random variable

- a. is the outcome that is most likely to occur.
- b. can be found by determining the 50% value in the c.d.f.
- c. equals the population median.
- d. is computed as a weighted average of the possible outcome of that random variable, where the weights are the probabilities of that outcome.

4.For a normal distribution, the skewness and kurtosis measures are as follows:

- a. 1.96 and 4
- b. 0 and 0
- c. 0 and 3
- d. 1 and 2

Answer:c

5.Two random variables X and Y are independently distributed if all of the following conditions hold, with the exception of

- a. $Pr(Y = y|X = x) = Pr(Y = y)$.
- b. knowing the value of one of the variables provides no information about the other.
- c. if the conditional distribution of Y given X equals the marginal distribution of Y.
- d. $E(Y) = E(X|Y)$.

Answer: d

6. To standardize a variable you

- a. subtract its mean and divide by its standard deviation.
- b. integrate the area below two points under the normal distribution.
- c. add and subtract 1.96 times the standard deviation to the variable.
- d. divide it by its standard deviation, as long as its mean is 1.

Answer: a

7. Assume that Y is normally distributed $N(\mu, \sigma^2)$. Moving from the mean (μ) 1.96 standard deviations to the left and 1.96 standard deviations to the right, then the area under the normal p.d.f. is

- a. 0.67
- b. 0.05
- c. 0.95
- d. 0.33

Answer: c

8. The Student t distribution is

- a. the distribution of the sum of m squared independent standard normal random variables.
- b. the distribution of a random variable with a chi-squared distribution with m degrees of freedom, divided by m .
- c. always well approximated by the standard normal distribution.
- d. the distribution of the ratio of a standard normal random variable, divided by the square root of an independently distributed chi-squared random variable with m degrees of freedom divided by m .

Answer: d

9. When there are ∞ degrees of freedom, the distribution

- a. can no longer be calculated.
- b. equals the standard normal distribution.
- c. has a bell shape similar to that of the normal distribution, but with “fatter” tails.
- d. equals the χ_∞ distribution.

Answer: b

10. The central limit theorem states that

- a. the sampling distribution of $\frac{\bar{Y} - \mu_Y}{\sigma_{\bar{Y}}}$ is approximately normal.
- b. $\bar{Y} \rightarrow p\mu_Y$.
- c. \bar{Y} has the smallest variance of all estimators.

d. the t distribution converges to the F distribution for approximately $n > 30$.

Answer: a

11. An estimator is

- a. an estimate.
- b. a formula that gives an efficient guess of the true population value.
- c. a random variable.
- d. a nonrandom number.

Answer: c

12. An estimator $\hat{\mu}_Y$ of the population value μ_Y is unbiased if

- a. $\hat{\mu}_Y = \mu_Y$
- b. \bar{Y} has the smallest variance of all estimators.
- c. $\bar{Y} \xrightarrow{P} \mu_Y$.
- d. $E(\hat{\mu}_Y) = \mu_Y$

13. An estimator $\hat{\mu}_Y$ of the population value μ_Y is consistent if

- a. $\mu_Y \xrightarrow{P} \mu_Y$.
- b. its mean square error is the smallest possible.
- c. Y is normally distributed.
- d. $\bar{Y} \xrightarrow{P} \mu_Y$.

Answer: a

14. An estimator $\hat{\mu}_Y$ of the population value μ_Y is more efficient when compared to another estimator $\tilde{\mu}_Y$, if

- a. $E(\hat{\mu}_Y) < E(\tilde{\mu}_Y)$.
- b. it has a smaller variance.
- c. its c.d.f. is flatter than that of the other estimator.
- d. both estimators are unbiased, and $Var(\hat{\mu}_Y) < Var(\tilde{\mu}_Y)$.

Answer: d

15. A type I error is

- a. always the same as (1-type II) error.
- b. the error you make when rejecting the null hypothesis when it is true.
- c. the error you make when rejecting the alternative hypothesis when it is true.
- d. always 5%.

Answer: b

16. The following are all least squares assumptions with the exception of:

- a. The conditional distribution of given has a mean of zero.
- b. The explanatory variable in regression model is normally distributed.
- c. $(X_i, Y_i), i = 1, \dots, n$ are independently and identically distributed.
- d. Large outliers are unlikely.

17. In the simple linear regression model, the regression slope

- a. indicates by how many percent Y increases, given a one percent increase in X .
- b. when multiplied with the explanatory variable will give you the predicted Y .
- c. indicates by how many units Y increases, given a one unit increase in X .
- d. represents the elasticity of Y on X .

Answer: c

18. The OLS estimator is derived by

- a. connecting the Y_i corresponding to the lowest X_i observation with the Y_i corresponding to the highest X_i observation.
- b. making sure that the standard error of the regression equals the standard error of the slope estimator.
- c. minimizing the sum of absolute residuals.
- d. minimizing the sum of squared residuals.

19. The sample average of the OLS residuals is

- a. some positive number since OLS uses squares.
- b. zero.
- c. unobservable since the population regression function is unknown.
- d. dependent on whether the explanatory variable is mostly positive or negative.

Answer: b

20. The sample average of the OLS residuals is

- a. some positive number since OLS uses squares.
- b. zero.
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Answer: b

21. The slope estimator, β_1 , has a smaller standard error, other things equal, if

- a. there is more variation in the explanatory variable, X .
- b. there is a large variance of the error term.
- c. the sample size is smaller.

d. the intercept, β_0 , is small.

Answer: a

22. The regression R^2 is a measure of

- a. whether or not X causes Y .
- b. the goodness of fit of your regression line.
- c. whether or not $ESS > TSS$.
- d. the square of the determinant of R .

Answer: b

23. $E(\epsilon_i|X_i) = 0$ says that

- a. dividing the error by the explanatory variable results in a zero (on average).
- b. the sample regression function residuals are unrelated to the explanatory variable.
- c. the sample mean of the X s is much larger than the sample mean of the errors.
- d. the conditional distribution of the error given the explanatory variable has a zero mean.

Answer: d

24. One of the following steps is not required as a step to test for the null hypothesis:

- a. compute the standard error of.
- b. test for the errors to be normally distributed.
- c. compute the t -statistic.
- d. compute the p-value.

Answer: b

25. The confidence interval for the sample regression function slope

- a. can be used to conduct a test about a hypothesized population regression function slope.
- b. can be used to compare the value of the slope relative to that of the intercept.
- c. adds and subtracts 1.96 from the slope.
- d. allows you to make statements about the economic importance of your estimate.

Answer: a