Econ 206/Test 2 (Version A)
Write your name on your scantron (-2% if not).

1. The probability of rolling a 12 with two dice is equal to
C
a. [redacted] b. [redacted]
b. [redacted]

a. 10/36 ~~b.~~ 1/12
c. 1/36 d. 6/36

2. The branch of mathematics ~~of~~ counting up possible outcomes for a variable, such as we did for dice, is known as
A
a. combinatorics b. expected value
c. probability distribution d. law of large numbers

3. In the casino game, roulette, there are 18 red spaced, 18 black spaces, and 2 green spaces. What is the expected value of red from a bettor's perspective if the payoff is $1 if red and $-1 if not red?
D
$EV = \$1\left(\frac{18}{38}\right) - \$1\left(\frac{20}{38}\right) = \$-0.05$
a. $0.50 b. $-0.15
c. $-0.01 d. $-0.05

4. Suppose you know that the probability of a defect in part A is 0.02 and in part B is 0.03. The probability of defects in both A and B (given independence) is $= (0.02)\cdot(0.03) = 0.0006$
D
a. 0.05 b. 0.06
c. 0.003 d. none of the above

5. Using the same information as the prior question, what is the probability of a defective part in ~~in~~ one or the other part? $= 0.02 + .03 = .05$
A or D
a. 0.05 b. 0.06 if mutually exclusive
c. 0.003 d. none of the above
$= .02 + .03 - .0006$
$.05 - .006 = .0494$ if not mutually exclusive

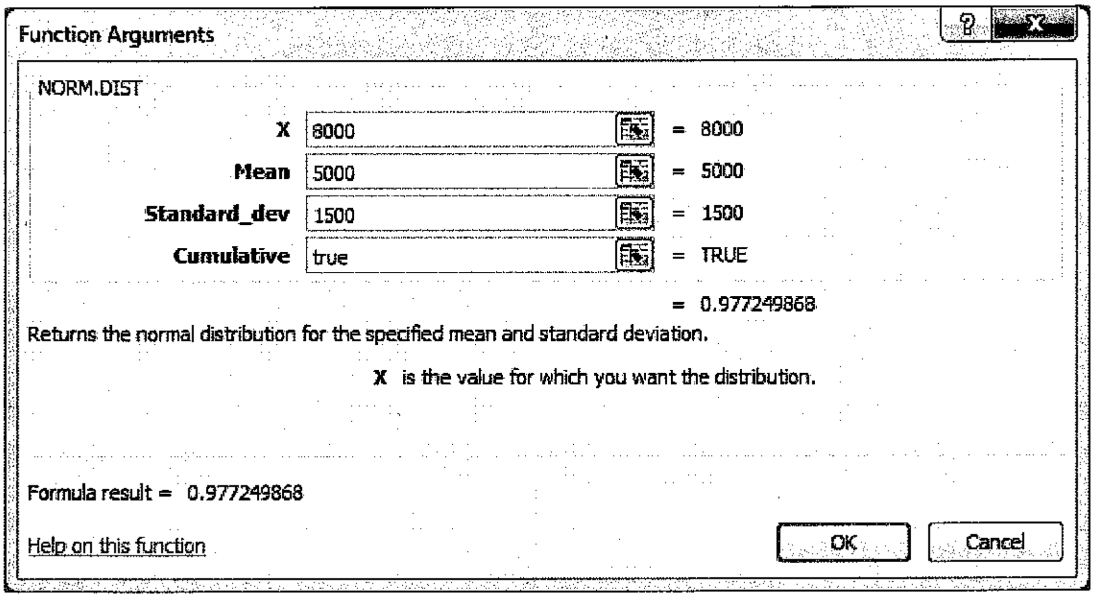
6. Suppose that the futures odds in Las Vegas for Kansas to win the NCAA championship is listed as 5:1. This implies that the probability of [redacted] Kansas winning is (apx)
B
a. 0.20 b. 0.17
c. 0.05 d. 0.02
$prob = \frac{1}{odds+1} = \frac{1}{5+1} = \frac{1}{6} \approx 0.17$

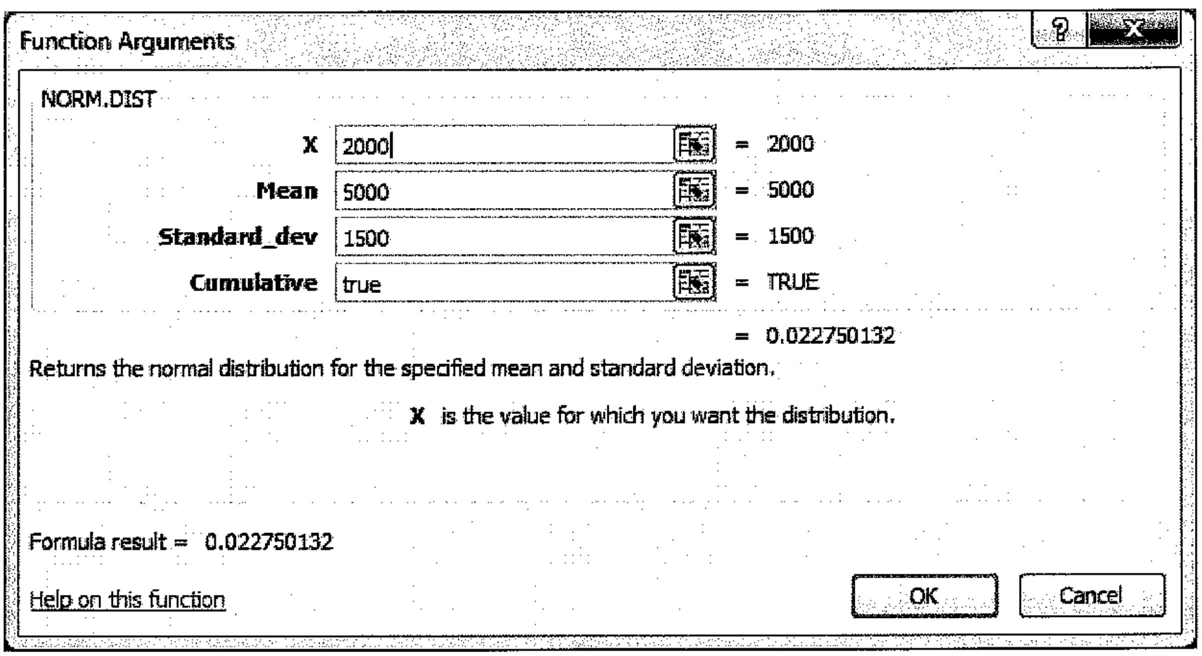
7. Which of the following is true about the t-distribution?
A
a. it was developed by a engineer/statistician working for Guinness Brewery
b. it is very similar to the normal distribution but adjusts for skew
c. it is useful whenever the distribution has positive skew
d. none of the above

8. Suppose that an insurance company computed the likelihood of a major health expense ($10,000) for you to be 0.10 and the probability of a minor expense ($1000) to be 1.0. The expected value of total health expenses would be
C
$EV = \$10{,}000\cdot(.10) + \$1000(1) = \$2000$
a. $210 b. $1100
c. $2000 d. $11,000

9. We illustrated the concept of Bayesian probability with the example of
B
a. the movie "Blow" b. the game show "Let's Make a Deal"
c. the movie "Moneyball" d. the game show "High Rollers"

10. The normal probability distribution is widely useful in determining probabilities for actual variables because it applies to
B
a. non-symmetrical outcomes
b. where the likelihood of being near the mean is higher than far from it
c. binary outcomes
d. all of the above





The Excel dialog box above contains data for daily store revenue in dollars

B

11. The first dialog box above displays a problem where
a. the probability of exactly $8000 in revenue is computed
b) the average revenue is $5000
c. almost all of the stores make at least $5000 per day in revenue
d. none of the above

12. For the data in the first Excel dialog box above, the probability that a store generates more than \$8000 in revenue in a day is (about)

D

a. 0.97 b. 0.47

c. 0.09 d. 0.03

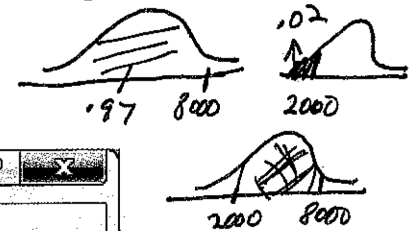
13. The probability that a store generates between \$2000 and \$8000 in revenue is equal to (apx)

C

a. 0.05 b. 0.99

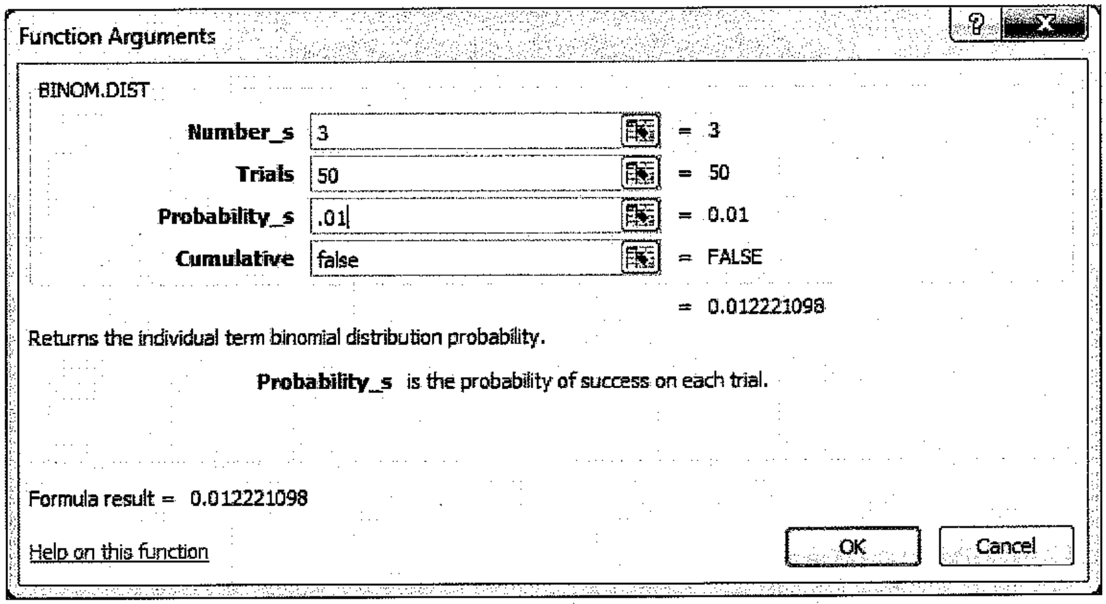
c. 0.95 d. 1.95

.97 − .02



= .97 − .02

= .95



The Excel dialog box above contains data on the production of specific brake part. In the problem, a "success" refers to a defective part.

14. For data in the Excel dialog box above above,

C

a. the probability that at least 3 defective parts are produced in 50 trials is 0.012 → This would be correct if Cumulative = True

b. the probability that at least 3 defective parts are produced in 50 trials is 0.988

c. the probability that $\boxed{\text{exactly}}$ 3 defective parts are produced in 50 trials is 0.012

d. the probability that exactly 3 defective parts are produced in 50 trials is 0.988

15. For the data in the Excel dialog box above, the probability of a defective part on any one trial is

A

a. 0.010 b. 0.012

c. 0.988 d. none of the above

16. for any binomial problem, a key aspect is that

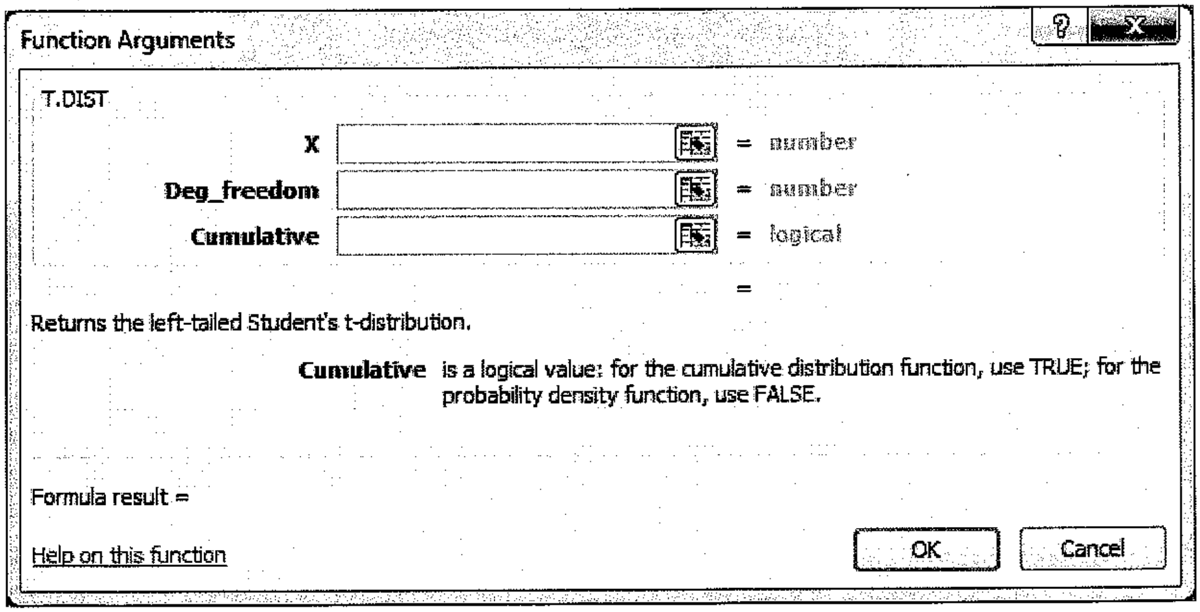
A

a. there are only two outcomes on a given trial, such as male-female

b. outcomes from one trial to the next are dependent, such as a head on one flip changes from flip to flip

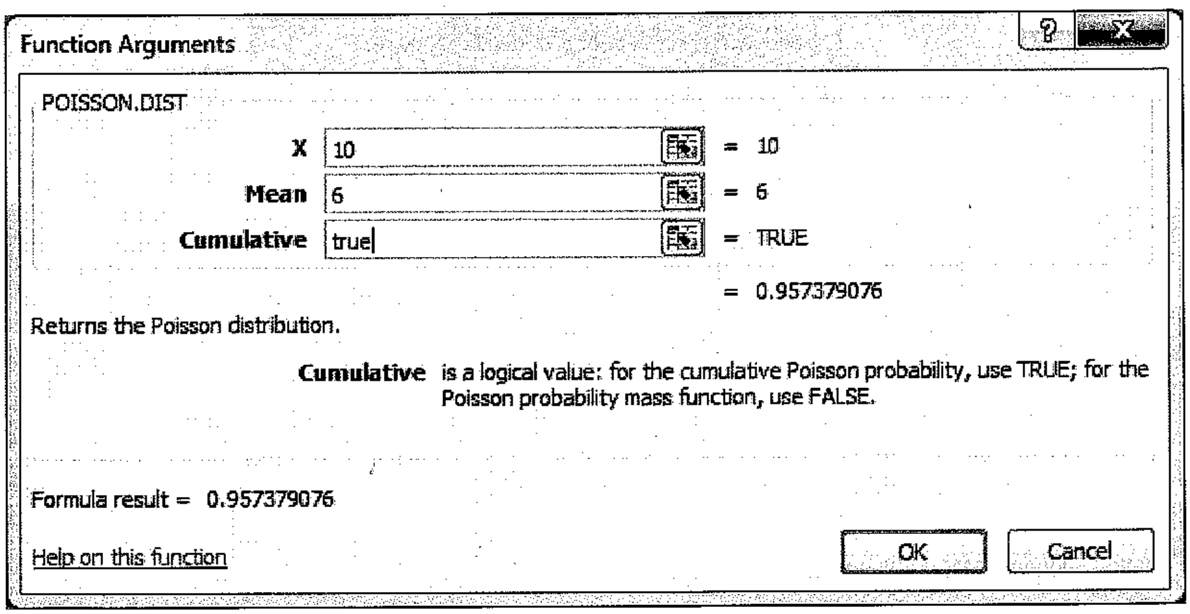
c. there can be no more than one trial examined

d. none of the above



D

17. In order to use the dialog box above, you must
a. compute degrees of freedom using the sample size minus 1
b. first standardized your original variable so the mean becomes 0
c. insert true for "Cumulative" to compute the probability of being less than X
d. all of the above



A

18. The dialog box above provides output using the Poisson distribution.
a. It is useful for computing the likelihood using "count data" such as complaints in a given time
b. It shows that the probability of exactly 10 items occurring is 0.957
c. It shows that the probability of more than 10 items occurring
d. It shows the probability of 6 items occurring in 10 minutes

19. The key to the famous "birthday problem" in probability is that
a. there are 365 days in a year so little chance of birthday sharing
B b. lots of possible birthday combinations for 50 people so a high chance of sharing
c. unequal distribution of birthdays across the calendar year so sometimes high/sometimes low
d. none of the above

20. Suppose that a major league hitter averages a hit 30 percent of the time. Which of the following is implied by "the Law of Large Numbers"?
C
a. if he gets 3 straight hits, his chances of seven straight outs increases
b. if he gets 3 straight hits, his chances of an out on the fourth at bat increases
c. he is likely to be closer to 30 percent in 500 at bats than in 50 at bats
d. none of the above

21. Put A for your answer

0
1
2
3
4
5
6
7
8
9

□□□□□□

$$\frac{n!}{(n-x)!} = \frac{10!}{(10-6)!}$$

10 items
arranged 6 at a time
order doesn't matter

10!
→ ways of arranging 10 items

$$\frac{10!}{X} = 1{,}000{,}000$$

$X = 3.628$

0
1
2
3

□□□

3 2 1 1
2 1 2 1
1 3 3 1

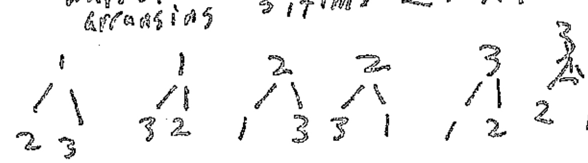
Combinations of 10 items

10^n

10^n

~~Combinations~~

ways of arranging 3 items ⟹ $n!$



123 132 213 $3\overset{2}{1}$ 312 321

2 at a time

$$\frac{n!}{(n-x)!} \quad \frac{n!}{(3-2)!} = 6$$

(x-   3 at a time

$4 \to 4! = 24$

$$\frac{24}{(n-x)!}$$