QUIZ 2: <u>120 Minutes</u>

Answer **ALL** questions.

OPEN BOOK (notes, assignments, and textbook) and electronic devices allowed. NO COLLABORATION or Internet use. Any violations result in an F. NO questions allowed during the test. Interpret and do the best you can.

GOOD LUCK!

Circle at most one answer per question.

10 points for each correct answer.

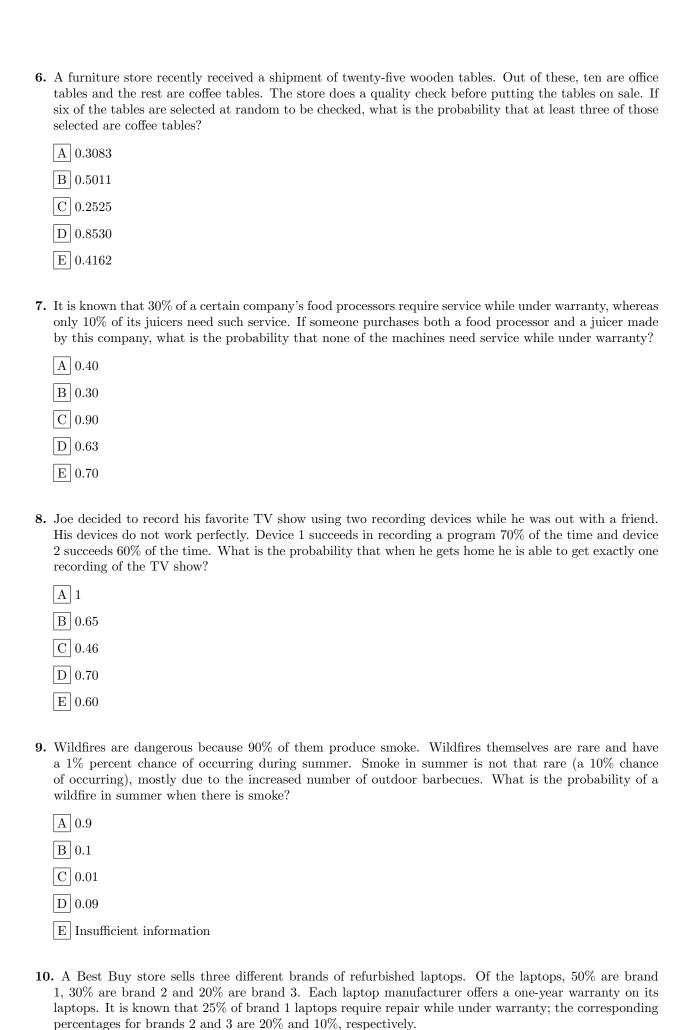
You **MUST** show **CORRECT** work to get full credit.

When in doubt, TINKER.

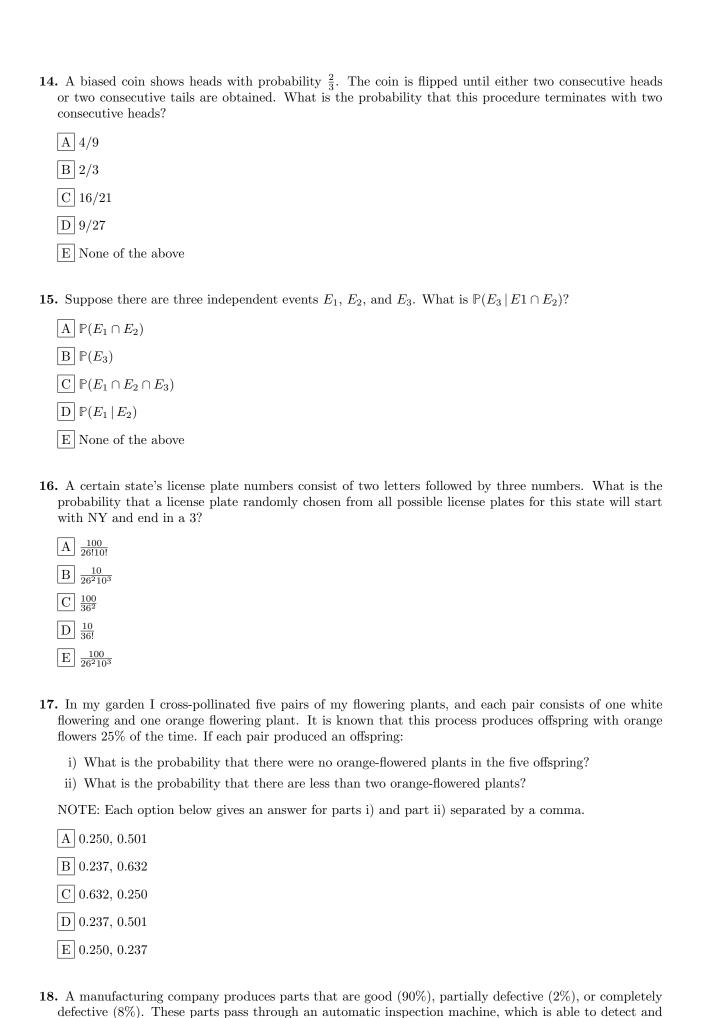
Total

200

1.	The chromatic numbers of the graphs K_n , L_n , S_n , and W_n satisfy which of the following orderings?
	$\boxed{\mathbf{A}} \chi(S_n) = \chi(W_n)$
	$\boxed{\mathrm{B}} \ \chi(K_n) \geq \chi(W_n)$
	$C \chi(L_n) < \chi(S_n)$
	$\boxed{\mathrm{D}} \chi(S_n) > \chi(W_n)$
	$\boxed{\mathrm{E}} \chi(K_n) < \chi(L_n)$
2.	If the greedy coloring algorithm is used to color W_6 , which of the following claims is true?
	A Six colors may be used
	B At least three colors will be used
	C At least four colors will be used
	D At most three colors will be used
	E None of the above
9	In the binomial expansion of $(x+1/x)^8$ the constant term is:
J.	_
	B 8
	<u>C</u> 70
	E None of the above
4.	The course requirement at a university is to select any three from a list of seven courses. If 200 students completed the degree requirement, what is the smallest number of students that must share the same course selections?
	$oxed{A}$ 6
	B 7
	$oxed{\mathrm{C}}$ 2
5.	How many solutions does the equation $x_1 + x_2 + x_3 = 12$ have when we impose the constraints $x_1 \ge 1$, $x_2 \ge 2$, and $x_3 \ge 3$?
	A 78
	B 21
	$oxed{C}$ 28
	D 18
	$oxed{\mathrm{E}}$ 15



i) What is the probability that a randomly selected customer has a laptop that needs repair while under warranty?	
ii) If a customer returns to the store with a laptop that needs warranty repair, what is the probability that it is a brand 1 laptop?	
NOTE: The options below state the answers for parts i) and ii) separated by a comma.	
lacksquare $0.50,0.71$	
lacksquare $0.121,0.45$	
$\boxed{ ext{C}}\ 0.205, 0.61$	
$\boxed{ extbf{D}} \ 0.290, \ 0.10$	
$\boxed{\mathrm{E}}\ 0.113, 0.69$	
11. How many four-digit numbers that are divisible by 5 can be formed from the digits 1, 2, 3, 4, 5, 6 and 7 when none of the digits are repeated?	Ĺ
A 120	
B 35	
C 24	
D 720	
E None of the above	
12. Your friend has three different email accounts. 70% of the messages come into account one, 20% come into account two and 10% come into account three. Of the messages in account one, only 1% are spans the corresponding percentages for accounts two and three are 2% and 5%, respectively. What is the probability that a randomly selected one of your friend's messages is spam?	;
$oxed{A}0.082$	
B 0.055	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	
$\begin{array}{c c} \hline \\ \hline D \\ 0.030 \end{array}$	
E None of the above	
13. A flu virus affects about one out of 10,000 people. There is a test to check whether the person has the flu virus. The test is quite accurate. In particular, we know that the probability that the test result is positive (suggesting the person has the flu virus), given that the person does not have the flu virus is only 2%; the probability that the test result is negative (suggesting the person does not have the flu virus), given that the person has the flu virus, is only 1%. A random person is tested for the flu virus and the result is positive. What is the probability that the person has the flu virus?	; , l
and the result is positive. That is the pressuring that the person has the right that	
A 0.1012	
A 0.1012	
A 0.1012 B 0.0203	



discard any part that is completely defective. What is the probability that a part is good given that it

passed the inspection machine?

- A 0.555
- B 0.978
- C 0.876
- D 0.333
- E None of the above
- 19. A row of houses are randomly assigned distinct numbers between 1 and 50 (inclusive). How many houses must there be to ensure that, within the collection of observed house numbers, there are 5 consecutive numbers?
 - A 11
 - B 50
 - C 40
 - D 41
 - E 49
- **20.** If n and k are positive integers with $n \geq k$, then
 - $\boxed{\mathbf{A}} \binom{n-1}{k} = \binom{n}{k} + \binom{n+1}{k}$
 - $\boxed{\mathbf{B}} \binom{n+1}{k} = \binom{n}{k-1} + \binom{n}{k}$
 - $\boxed{\mathbf{C}} \binom{n-1}{k-1} = \binom{n}{k} + \binom{n+1}{k}$
 - $\boxed{\mathbf{D}} \binom{n+1}{k-1} = \binom{n}{k-1} + \binom{n+1}{k}$
 - E None of the above