"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

________________________
Signature of student

Academic Integrity Task Force, 2004

This is a 15-question multiple-choice exam; there is no partial credit. Each problem is worth 7 points, for a total of 105 points. There will be a 20-point deduction if your phone rings or vibrates, or if you have your phone on your person during the exam. There will be a 5-point deduction if you have other transgressions. Other transgressions include not having the correct Scantron form 882E, not filling out your Scantron form correctly, having a folded or mutilated Scantron, not clearing your calculator before and after the exam, having any electronic device on you during the exam, not having your TAMU student ID, not following directions, not turning in your exam and Scantron on time (you must be finished filling in your Scantron and exam cover before time is called), not filling out this exam cover sheet correctly, or using an unapproved calculator. You must put your first name and last name, as officially known by TAMU, on this exam cover as well as on your Scantron; no nicknames or middle names, without your first and last name. The Scantron will not be returned so also mark all your answers on this exam paper. Your exam grade will be posted in WebAssign.

Note: It is a violation of the Aggie Honor Code to continue writing or taking the exam after time is called.

ALL CELL PHONES MUST BE TURNED OFF AND PLACED IN YOUR BACKPACK!

CALCULATORS MUST BE RESET BEFORE AND AFTER THE EXAM!

SCANTRON: Please double check to make sure you have completed your Scantron correctly, as shown below.

Name: print your legal name neatly (NO NICKNAMES)
Subject: Math 141
Date: March 2012
Test No.: MUSIC
Period: your section number

Clear your calculator BEFORE and AFTER your exam. MEM (2nd +), Reset, ALL, Reset
To turn on the correlation coefficient: Catalog (2nd 0), DiagnosticOn, Enter, Enter

There are three kinds of people in the world; those that can count and those that cannot.
1. You have 6 baseball pitchers, 5 shortstops, and 4 outfielders in your baseball trading card collection. How many ways is it possible to stack up the cards if the baseball cards of the same player type are grouped together?
   
   a. 120  
   b. None of these  
   c. 360  
   d. 2,073,600  
   e. 12,441,600

2. Out of 640 food aficionados
   - 205 liked only Mediterranean (M) dishes
   - 80 liked South American (S) dishes but not Mediterranean dishes
   - 100 liked Mediterranean dishes and French dishes
   - 85 liked South American dishes and French dishes
   - 125 like Mediterranean dishes and South American dishes but not French dishes

   Use the above information along with the given Venn diagram to find how many liked exactly one or two of these types of dishes?

   a. 277  
   b. 545  
   c. 559  
   d. 296  
   e. None of these

3. How many ways can a pilot, copilot, 2 passengers, and 3 ground crew be selected from a group of 10? Assume all ten can fulfill any of the positions.

   a. 604,800  
   b. 5040  
   c. 120  
   d. None of these  
   e. 50,400
4. Which regions form the solution set of the system of equations:

\[
\begin{align*}
2y & \geq 3x - 50 \\
4y & \leq x + 50 \\
x + y & \geq 0 \\
x & \geq 0
\end{align*}
\]

a. Only \(h\) and \(r\)

b. Only \(c\)

c. None of these

d. Only \(g\) and \(h\)

e. Only \(h\)

For the next two problems:

- \(U = A \cup B \cup C\)
- \(A = \{h, o, r, s, e\}\)
- \(B = \{d, o, g\}\)
- \(C = \{x \mid x\text{ is a letter in the word roses}\}\)

5. Mark the one statement that is **TRUE**.

a. \(A \cup B = \{o\}\)

b. \(\{g\} \in B\)

c. \(\{o, h\} \subseteq A\)

d. \(A \cap B \cap C = \emptyset\)

e. \(n((A \cup B)^c \cap C) = \emptyset\)

6. Mark the one statement that is **FALSE**.

a. \(n(C) = 4\)

b. \(A \subseteq C\)

c. \(A\) has 30 nonempty proper subsets

d. \(C^c = \{h, d, g\}\)

e. \(B\) and \(B^c\) are disjoint sets
FOR THE NEXT TWO PROBLEMS: AgBelt makes leather belts with brass buckles. AgBelt has 120 brass buckles and 640 units of leather available. An adult belt uses 6 units of leather and a kid belt uses 5 units of leather. Each belt has one buckle. Due to order history AgBelt wants to make at least 10 kid belts and at least 20 adult belts, but no more than 90 adult belts. If the adult belt sells for $16 and the kid belt sells for $12, what is AgBelt's maximum revenue? An INCOMPLETE graph is given to help you work the problem, where $x$ is the number of adult belts and $y$ is the number of kid belts.

7. What is the solution?

   a. None of these
   b. A maximum revenue of $1680 is reached when 90 adult belts and 20 kid belts are made and sold.
   c. A maximum revenue of $1600 is reached when 40 adult belts and 80 kid belts are made and sold.
   d. A maximum revenue of $1520 is reached when 20 adult belts and 100 kid belts are made and sold.
   e. A maximum revenue of $1688 is reached when 98 adult belts and 10 kids belts are made and sold.

8. Discuss leftovers.

   a. There are 2 units of leather and 12 buckles leftover.
   b. There are 20 units of leather and 0 buckles leftover.
   c. None of these
   d. There are 0 units of leather and 0 buckles leftover.
   e. There are 0 units of leather and 10 buckles leftover.
9. Let \( a \) be the dollars invested in stock \( A \), \( b \) be the dollars invested in stock \( B \), and \( c \) be the dollars invested in stock \( C \). Fish Aggie has $1,000,000 available to invest. Translate “Fish Aggie wants to invest at least 30% of his total investment in stock \( C \)” into a math model.

a. \( c \geq 300,000 \)

b. \( 0.7a + 0.7b - 0.3c \leq 0 \)

c. \( c \leq 300,000 \)

d. \( 0.3a + 0.3b - 0.7c \leq 0 \)

e. \( 0.3a + 0.3b - 0.7c \geq 0 \)

10. The corner points of the bounded feasible region of a linear programming problem are (30, 30), (20, 20), and (24, 18). If \( x \) is the number of female students and \( y \) is the number of male students, what is the number of female and male students that will minimize \( M = 2x + 4y \)?

a. All the points \((x \text{ females}, y \text{ males})\) on the line segment with endpoints (20, 20) and (24, 18).

b. 20 females and 20 males, or 24 females and 18 males

c. 30 females and 30 males

d. 20 females and 20 males, 22 females and 19 males, or 24 females and 18 males

e. None of these

11. Two fair 6-sided dice are tossed and the uppermost numbers are observed. Give the event \( E \) that the sum of the dice is 8.

a. \( E = \{8\} \)

b. \( E = \{(2, 6), (3, 5), (4, 4)\} \)

c. \( E = \{(2, 6), (3, 5), (4, 4), (6, 2), (5, 3)\} \)

d. \( E = (2, 6), (3, 5), (4, 4) \)

e. \( E = (2, 6), (3, 5), (4, 4), (6, 2), (5, 3) \)

12. Your small marble collection consists of a blue marble \( (B) \), a green marble \( (G) \), and a multicolored marble \( (M) \). You pick one marble and note its color. Which of the following is a sample point of this experiment, followed by the number of events this experiment has?

a. \( B, 8 \)

b. \( \{G\}, 8 \)

c. \( G, 3 \)

d. \( \{M\}, 3 \)

e. \( M, 1 \)
13. Which areas of the Venn diagram would be shaded to represent the set \((A \cup B^C)^c\)?

a. \(c, f\)
b. \(b, c, e, f, g, h\)
c. None of these
d. \(a, b, c, d, e, f\)
e. \(c, f, h\)

14. An urn contains 4 lilac balls, 3 peach balls, and 8 teal balls. If a sample of 5 balls is chosen at random, how many ways is it possible to get exactly 3 peach balls or exactly 1 teal ball?

a. 32
b. None of these
c. 346
d. 8
e. 314

15. A store has 5 identical large T-shirts, 2 identical medium T-shirts, 3 identical small T-shirts, and 3 different extra-small T-shirts. How many distinguishable ways can these T-shirts be lined up on a clothes line?

a. 4,324,320
b. 6,227,020,800
c. 207,567,360
d. 207,360
e. None of these