

ELEMENTARY STATISTICS TEST ONE SAMPLE QUESTIONS.

SHOW ALL CALCULATIONS.GIVE ANSWERS.AS REDUCED FRACTIONS, OR TO 6 DECIMALS.

ACTUAL TEST MAY HAVE PROBLEMS DIFFERENT FROM THESE.

1. Given the frequency table

x	2	3	4	5	6	7
f	15	20	35	20	8	2

(4 points)

find (a) the **depth** of the median, and the **median**

(4 points)

(b) the **mean**

(1 point)

(c) the **mode**

(2 points)

(d) the **midrange**

(5 points)

(e) the **midquartile**

(4 points)

(f) the **depth** of the 35th percentile, and the **35th percentile**

(6 points)

(g) the **sample variance**

(2 points)

(h) the **sample standard deviation**

(5 points)

2. We want to include at least 60% of an unknown distribution within  $k$  standard deviations of its mean. Find the smallest  $k$  that will guarantee this.

(5 points)

3.  $X$  has a distribution with mean 75 and standard deviation 20. Find the **z-score** for  $X = 90$ .

(2 points)

4. (a) Complete the table

(2 points)

(b)  $SS(x) =$

(2 points)

(c)  $SS(y) =$

(2 points)

(d)  $SS(xy) =$

(2 points)

(e) Find  $r$ , the **coefficient of linear correlation**.

(5 points)

(f) Find the **equation** of the **line of best fit** in the form  $y = mx + b$

(2 points)

(g) Predict  $y$  if  $x = 10$ .

x	y	$x^2$	$y^2$	xy
3	9			
4	8			
6	7			
7	5			

4. One card is drawn at random from a standard deck of 52 cards. Events are  $C =$  club,  $R =$  red card,  $L =$  card lower than a six.  $G =$  **not** a face card. From these events list a **pair** of events that are

(2 points)

(a) **mutually exclusive** \_\_\_\_\_

(2 points)

(b) **independent** \_\_\_\_\_

(2 points)

(c) **neither** independent not mutually exclusive. \_\_\_\_\_

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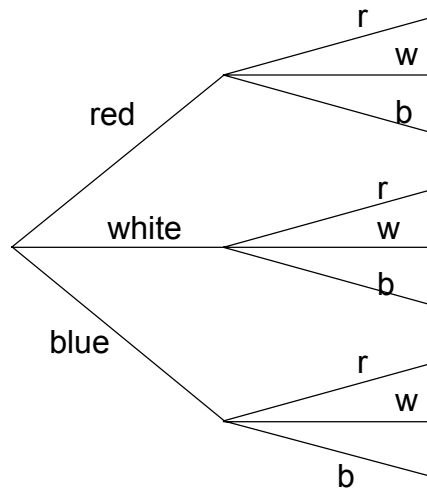
ACTUAL TEST MAY HAVE PROBLEMS DIFFERENT FROM THESE.

5. A natural number from 1 to 30, inclusive, is drawn at random. (Each of the 30 numbers has probability  $1/30$  of being drawn.) Let  $E$  be the event "the number is even", and  $F$  be the event "the number is a multiple of 7". Find

- (2 points) (a)  $P(E) =$
- (2 points) (b)  $P(F) =$
- (2 points) (c)  $P(E \cap F)$
- (5 points) (d)  $P(E \cup F)$
- (5 points) (e)  $P(F | E)$
- (3 points) (f) if  $E$  and  $F$  are independent or not. (explain)

6. An urn contains three red marbles, two white marbles and four blue marbles. We draw two marbles, one at a time, without replacement.

- (3 points) (a) What is the probability of getting a white marble on the second draw, given that we got a blue one on the first draw?
- (5 points) (b) In the **tree diagram** below, label each branch with its conditional probability, and each branchtip with its probability.



7. We get 60% of our parts from LA, 30% from SF and 10% from OC. Only 0.5% of LA parts are defective. 1.2% of SF parts are defective. 1.4% of OC parts are defective.

- (8 points) (a) Make a complete Bayes' Theorem table.
- (2 points) (b) What is the probability that a randomly chosen part is defective? \_\_\_\_\_
- (2 points) (c) What is the probability a part came from SF if it is defective? \_\_\_\_\_

( 100 points, total. )