**PROBLEM SET 4**

TEST I.

1. Deﬁne mutually exclusive events, and give an example of two events that are mutually exclusive and two events that are not mutually exclusive.
2. Determine whether these events are mutually exclusive.

a. Roll a die: Get an even number, and get a number less than 3.

b. Roll a die: Get a prime number (2, 3, 5), and get an odd number.

c. Roll a die: Get a number greater than 3, and get a number less than 3.

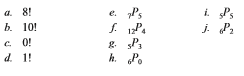
d. Select a student in your class: The student has blond hair, and the student has blue eyes.

e. Select a student in your college: The student is a sophomore, and the student is a business major.

f. Select any course: It is a calculus course, and it is an English course.

g. Select a registered voter: The voter is a Republican, and the voter is a Democrat.

3. Evaluate each of these.



4.County Assessments The County Assessment Bureau decides to reassess homes in 8 different areas. How many different ways can this be accomplished?

5. Sports Car Stripes How many different 4-color code stripes can be made on a sports car if each code consists of the colors green, red, blue, and white? All colors are used only once.

6. Manufacturing Tests An inspector must select 3 tests to perform in a certain order on a manufactured part. He has a choice of 7 tests. How many ways can he perform 3 different tests?

7. Threatened Species of Reptiles There are 22 threatened species of reptiles in the United States. In how many ways can you choose 4 to write about? (Order is not important.)

8. Inspecting Restaurants How many different ways can a city health department inspector visit 5 restaurants in a city with 10 restaurants?

9. How many different 4-letter permutations can be formed from the letters in the word

decagon?

10.. ID Cards How many different ID cards can be made if there are 6 digits on a card and no digit can be used more than once?

11. Free-Sample Requests An online coupon service has 13 offers for free samples. How may different requests are possible if a customer must request exactly 3 free samples? How many are possible if the customer may request up to 3 free samples?

12. Ticket Selection How many different ways can 4 tickets be selected from 50 tickets if each ticket wins a different prize?

13. Movie Selections The Foreign Language Club is showing a four-movie marathon of subtitled movies. How many ways can they choose 4 from the 11 available?

14. Task Assignments How many ways can an adviser choose 4 students from a class of 12 if they are all assigned the same task? How many ways can the students be chosen if they are each given a different task?

15. Zip Codes How many 5-digit zip codes are possible if digits can be repeated? If there cannot be repetitions?

16. Batting Order How many ways can a baseball manager arrange a batting order of 9 players?

17. Video Games How many different ways can 7 different video game cartridges be arranged on a shelf? 4. Seating Arrangements In how many ways can 5 speakers be seated in a row on a stage?

18. Shampoo Display Astore manager wishes to display 8 different brands of shampoo in a row. How many ways can this be done?

19. Show Programs Three bands and two comics are performing for a student talent show. How many different programs (in terms of order) can be arranged? How many if the comics must perform between bands?

20. Campus Tours Student volunteers take visitors on a tour of 7 campus buildings. How many different tours are possible? (Assume order is important.)

21. Radio Station Call Letters The call letters of a radio station must have 4 letters. The ﬁrst letter must be a K or a W. How many different station call letters can be made if repetitions are not allowed? If repetitions are allowed?

22. Identiﬁcation Tags How many different 3-digit identiﬁcation tags can be made if the digits can be used more than once? If the ﬁrst digit must be a 5 and repetitions are not permitted?

23. Book Arrangements Areference encyclopedia has 12 volumes. Disregarding alphabetical or numerical order, in how many ways can the books be arranged on a shelf?

24. Evaluate each expression.

25. The set of all possible outcomes of a probability experiment is called the \_\_\_\_\_\_\_\_\_\_\_.

26. The probability of an event can be any number between and including \_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

27. If an event cannot occur, its probability is \_\_\_\_\_\_\_\_\_\_\_\_\_.

28. The sum of the probabilities of the events in the sample space is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

29. When two events cannot occur at the same time, they are said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TEST II.Determine whether each statement is true or false. If the statement is false, explain why.

1. Subjective probability has little use in the real world.

2. Classical probability uses a frequency distribution to compute probabilities.

3. In classical probability, all outcomes in the sample space are equally likely.

4. When two events are not mutually exclusive, P(A or B) P(A) P(B).

5. If two events are dependent, they must have the same probability of occurring.

6. An event and its complement can occur at the same time.

7. The arrangement ABC is the same as BAC for combinations.

8. When objects are arranged in a speciﬁc order, the arrangement is called a combination.