Exam

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) What is the set of all possible outcomes of a probability experiment? 1) _____
A) events B) the sample space
C) a Venn diagram D) an outcome

2) How many possible outcomes would there be if three coins were tossed once? 2) _____
A) 8 B) 2 C) 6 D) 4

3) What type of probability uses a knowledge of sample spaces as opposed to experiments to determine the numerical probability that an event will occur? 3) _____
A) classical probability B) subjective probability
C) conditional probability D) empirical probability

4) If a sportscaster makes an educated guess as to how well a team will do this season, he is using what type of probability? 4) _____
A) conditional probability B) empirical probability
C) classical probability D) subjective probability

5) A compound event consists of two or more outcomes or simple events. 5) _____
A) True B) False

6) Classical probability was the first type of probability studied formally by mathematicians of the 17th and 18th centuries. 6) _____
A) True B) False

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

7) A child gets 20 heads out of 30 tosses of a coin. If he declared the chance of getting a head with that coin were 2/3, that would be an example of _____ probability. 7) _____

8) If one tosses a coin enough times, the number of heads and tails will tend to "even out." This is an example of the law of _____. 8) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

9) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked. 9) _____

List the outcomes of the sample space.
A) {LLU, LUL, ULL, UUL, ULL, LUU}
B) {LLL, UUU}
C) {LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU}
D) None of these.

10) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked. 10) _____

Let *A* be the event that all three doors are in the same condition. List the outcomes of *A*. [Let "L" designate "locked" and U" designate "unlocked".]
A) {LLL}
B) {LLL, UUU}
C) {LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU}
D) None of these.

11) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked. 11) _____

Let *B* be the event that exactly two doors are in the same condition. List the outcomes of *B*. [Let "L" designate "locked" and U" designate "unlocked".]
A) {LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU}
B) {LLU, LUL, ULL}
C) {LLU, LUL, ULL, LUU, ULU, UUL}
D) None of these.

12) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked. 12) _____

Let *B* be the event that exactly two doors are locked. List the outcomes of *B*. [Let "L" designate "locked" and U" designate "unlocked".]
A) {LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU}
B) {LLU, LUL, ULL}
C) {LLU, LUL, ULL, LUU, ULU, UUL}
D) None of these.

13) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked. 13) _____

Let *C* be the event that at least two doors are in the same condition. List the outcomes of *C*. [Let "L" designate "locked" and U" designate "unlocked".]

A) {LLL, UUU, LLU, LUL, ULL}
B) {LLU, LUL, ULL, LUU, ULU, UUL}
C) {LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU}
D) None of these.

14) Nanette must pass through three doors as she walks from her company's foyer to her office. Each of these doors may be locked or unlocked. 14) _____

Let *C* be the event that at least two doors are unlocked. List the outcomes of *C*. [Let "L" designate "locked" and U" designate "unlocked".]

A) {LLL, LLU, LUL, LUU, ULL, ULU, UUL, UUU}
B) {UUU, LUU, ULU, UUL}
C) {LLU, LUL, ULL, LUU, ULU, UUL}
D) None of these.

15) If the probability that it will rain tomorrow is 0.39, what is the probability that it will not rain tomorrow? 15) _____

A) -0.39 B) 1.39 C) 0.39 D) 0.61

16) The statement, "The probability that a certain sports team will win it's next game is about 60%," is an example of 16) _____

A) a sample space. B) subjective probability.
C) empirical probability. D) classical probability.

17) If there are 12 equally likely events, then the probability of the first one occurring is 1/12. 17) _____

A) False B) True

18) If a die were rolled, the event of getting an even number would be called a simple event. 18) _____

A) False B) True

19) Tree diagrams are useful for 19) _____

A) ordering outcomes from lowest to highest.
B) showing that the outcome is the set of all possible sample spaces.
C) finding all possible outcomes in a probability experiment involving several steps.
D) illustrating the law of large numbers.

20) Two events are mutually exclusive if they cannot both occur. 20) _____

A) False B) True

21) Find the probability of getting a number greater than 4 when a die is rolled one time. 21) _____

A) $\frac{2}{3}$ B) $\frac{1}{3}$ C) $\frac{1}{6}$ D) $\frac{1}{2}$

22) If two dice are rolled one time, find the probability of getting a sum of 6. 22) _____

A) $\frac{1}{12}$ B) $\frac{1}{6}$ C) $\frac{7}{36}$ D) $\frac{5}{36}$

23) If two dice are rolled one time, find the probability of getting a sum less than 5. 23) _____

A) $\frac{1}{3}$ B) $\frac{1}{6}$ C) $\frac{5}{36}$ D) $\frac{7}{36}$

24) If a red suit is drawn from an ordinary deck of cards, what is the probability that the card is a diamond? 24) _____

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{1}{3}$

25) A 12-sided die can be made from a geometric solid called a dodecahedron. Assume that a fair dodecahedron is rolled. 25) _____

The sample space is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}.

Find $P(4)$.

A) 1/3 B) 2/3 C) 1/4 D) 1/12

26) A 12-sided die can be made from a geometric solid called a dodecahedron. Assume that a fair dodecahedron is rolled. 26) _____

The sample space is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}.

Find P(Less than 3).

A) 1/4 B) 2/3 C) 1/12 D) 1/6

27) A 12-sided die can be made from a geometric solid called a dodecahedron. Assume that a fair dodecahedron is rolled. 27) _____

The sample space is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}.

Find *P*(Greater than 4).

A) 7/12 B) 2/3 C) 1/4 D) 1/12

28) According to a survey, 43% of teenagers could recognize a picture of legendary film star John Wayne. What is the probability that a randomly-selected teenager could recognize John Wayne? 28) _____

A) 0.01 B) 0.75 C) 0.43 D) 0.57

29) For this year's mayoral election, voter dissatisfaction is very high. In a survey of 100 likely voters, 26 said they planned to write in an independent candidate rather than vote for the Democrat or Republican candidate for mayor. 29) _____

What is the probability that a surveyed voter plans to write in an independent candidate?

A) 0.026 B) 0.1 C) 0.26 D) 0.74

30) For this year's mayoral election, voter dissatisfaction is very high. In a survey of 500 likely voters, 240 said they planned to write in an independent candidate rather than vote for the Democrat or Republican candidate for mayor. 30) _____

Estimate the percentage of voters who plan to write in an independent candidate?

A) 52% B) 48% C) 24% D) 50%

31) In a poll of 416 university students, 170 said that they were opposed to legalizing marijuana. What is the probability that a surveyed student opposes legalization of marijuana? 31) _____

A) 0.409 B) 0.591 C) 0.309 D) 0.691

32) In a poll of 667 university students, 313 said that they were opposed to legalizing marijuana. Estimate the percentage of students who oppose legalizing marijuana. 32) _____

A) 11.6% B) 88.4% C) 46.9% D) 53.1%

33) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). List all the outcomes of the sample space. 33) _____

A) {A, B, C}
B) {AB, AC, BA, BC, CA, CB}
C) {AA, AB, AC, BA, BB, BC, CA, CB, CC}
D) {AA, AB, AC, BB, BC, CC}

34) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that both answers are "C". [Hint: List all the outcomes of the sample space first.] 34) _____

A) 1/9 B) 1/6 C) 1/27 D) 1/3

35) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that both answers are the same ("AA", "BB" or "CC"). [Hint: List all the outcomes of the sample space first.] 35) _____

A) 1/6 B) 1/27 C) 1/3 D) 1/9

36) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that at least one answer is "A". [Hint: List all the outcomes of the sample space first.] 36) _____

A) 7/9 B) 5/9 C) 2/3 D) 1/3

37) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that the second answer is either "B" or "C". [Hint: List all the outcomes of the sample space first.] 37) _____

A) 7/9 B) 2/3 C) 5/9 D) 1/3

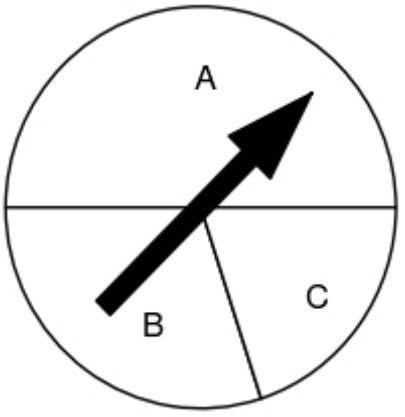
38) A section of an exam contains two multiple-choice questions, each with three answer choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the probability (as a reduced fraction) that neither of the answers is "B". [Hint: List all the outcomes of the sample space first.] 38) _____

A) 5/9 B) 4/9 C) 1/3 D) 2/3

39) A coin is tossed 758 times and comes up heads 409 times. Use the Empirical Method to approximate the probability that the coin comes up heads. 39) _____

A) 0.46 B) 0.54 C) 0.35 D) 0.5

40) The arrow on the spinner shown below can be spun so that the arrowhead eventually stops in one of the three sectors labeled "A", "B", or "C". The spinner is spun 124 times and comes up "A" 52 times. Use the Empirical Rule to approximate the probability that the spinner comes up "A". 40) _____



A) 0.581 B) 0.419 C) 0.5 D) 0.295

41) So far this season, the university's football team has executed 145 running plays, 149 passing plays, and 24 "trick" plays. What is the probability that the team will execute a passing play? 41) _____

A) 0.469 B) 0.531 C) 0.507 D) 0.456

42) So far this season, the university's football team has executed 155 running plays, 143 passing plays, and 19 "trick" plays. What is the probability that the team will *not* execute a trick play? 42) _____

A) 0.064 B) 0.936 C) 0.94 D) 0.06

43) A Karate club consists of 52 persons holding a black belt (highest rating), 69 persons holding a brown belt (middle rating), and 83 persons holding a purple belt (lowest rating). What is the probability that a randomly-selected club member holds a black belt? 43) _____

A) 0.658 B) 0.255 C) 0.745 D) 0.342

44) At Wassamatta University, 59.3% of the student body are males. Choose one student at random. What is the probability that the student is female? 44) _____

A) 59.3% B) 40.7% C) 50% D) -9.3%

45) The staff at a small company includes: 4 secretaries, 20 technicians, 4 engineers, 2 executives, and 50 factory workers. If a person is selected at random, what is the probability that he or she is a factory worker? 45) _____

A) $\frac{1}{8}$ B) $\frac{2}{5}$ C) $\frac{5}{8}$ D) $\frac{1}{4}$

46) At a certain college, there were 700 science majors, 300 engineering majors, and 500 business majors. If one student was selected at random, the probability that the student is an engineering major is 46) _____

A) $\frac{1}{3}$ B) $\frac{4}{5}$ C) $\frac{1}{5}$ D) $\frac{1}{4}$

47) In a recent study, the following responses were obtained to the question, "Do you favor recycling in your neighborhood?" 47) _____

	Yes	***No***	***No Opinion***
Males	25	15	10
Females	30	10	10

If a response is picked at random, what is the probability that it came from a male or that it indicated no opinion regarding recycling?

A) $\frac{3}{10}$ B) $\frac{3}{5}$ C) $\frac{4}{5}$ D) $\frac{7}{10}$

48) A Karate club consists of 41 persons holding a black belt (highest rating), 59 persons holding a brown belt (middle rating), and 73 persons holding a purple belt (lowest rating). What is the probability that a randomly-selected club member holds a brown belt or a purple belt? 48) _____

A) 0.763 B) 0.689 C) 0.237 D) 0.311

49) A survey asked respondents to indicate their level of satisfaction with government spending. The results are show below. 49) _____

Response	Number
Very satisfied	599
Somewhat satisfied	4694
Dissatisfied	7410
Total	12,703

What is the probability that a sampled person was only somewhat satisfied or dissatisfied with government's spending?

A) 0.951 B) 0.049 C) 0.953 D) 0.047

50) A survey asked respondents to indicate their level of satisfaction with government spending. The results are show below. 50) _____

Response	Number
Very satisfied	774
Somewhat satisfied	3959
Dissatisfied	7668
Total	12,401

Assume this is a simple random sample from a population. Use the Empirical Method to estimate the probability that a person is dissatisfied with government's spending?

A) 0.659 B) 0.33 C) 0.382 D) 0.618

51) A survey asked 32,011 homeowners how many pets they owned. The results were as followed: 51) _____

Number of Pets	Number of Homeowners
0	5583
1	10,423
2	8856
3	6349
4 or more	800
Total	32,011

What is the probability that a sampled homeowner has three pets?

A) 0.777 B) 0.223 C) 0.198 D) 0.025

52) A survey asked 34,407 homeowners how many pets they owned. The results were as followed: 52) _____

Number of Pets	Number of Homeowners
0	6120
1	11,915
2	9360
3	6363
4 or more	649
Total	34,407

What is the probability that a sampled homeowner has more than 1 pet?

A) 0.524 B) 0.204 C) 0.476 D) 0.178

53) A survey asked 32,901 homeowners how many pets they owned. The results were as followed: 53) _____

Number of Pets	Number of Homeowners
0	6316
1	9709
2	9627
3	6618
4 or more	631
Total	32,901

Assume this is a simple random sample of homeowners. Use the Empirical Method to estimate the probability that a homeowner has at least one pet.

A) 0.762 B) 0.238 C) 0.808 D) 0.192

54) There are 27,842 undergraduate students enrolled at a certain university. The age distribution is as follows: 54) _____

Age Range	Number
13 - 14	2
15 - 17	49
18 - 22	11,563
23 - 30	9568
31 and up	6660
Total	27,842

What is the probability that a student is between 23 and 30 years old?

A) 0.239 B) 0.583 C) 0.417 D) 0.344

55) There are 28,446 undergraduate students enrolled at a certain university. The age distribution is as follows: 55) _____

Age Range	Number
13 - 14	5
15 - 17	434
18 - 22	12,057
23 - 30	9256
31 and up	6694
Total	28,446

What is the probability that a student is less than 18 years old?

A) 0.235 B) 0.00018 C) 0.0154 D) 0.0153

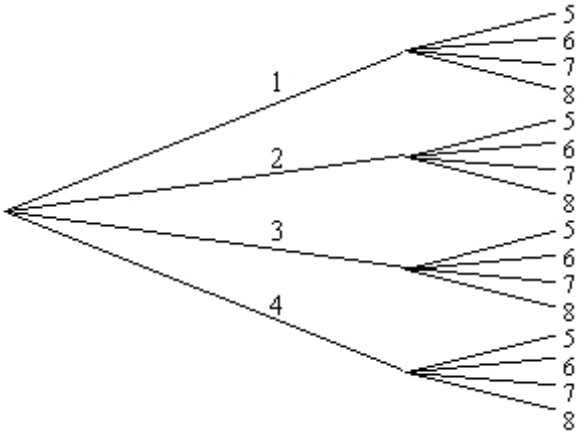
56) A jar contains four white marbles, five red marbles, and six black marbles. If a marble were selected at random, the probability that it is white or black would be $\frac{2}{3}$. 56) _____

A) True B) False

57) A probability experiment has two steps. There are two possible results for the first step, call them "A" and "B". If the result for the first step was "A", then there would be 5 possible results for the second step. If the result for the first step was "B", then there would be 12 possible results for the second step. How many possible outcomes are there for this experiment? 57) _____

A) 8 B) 17 C) 60 D) 12

58) Box A contains the numbers 1, 2, 3, and 4. Box B contains the numbers 5, 6, 7, and 8. A number is first drawn from Box A and then another number from Box B. Using the figure below, how many outcomes are possible if both numbers are even? 58) _____



A) 6 B) 16 C) 4 D) 8

1) B
2) A
3) A
4) D
5) A
6) A
7) empirical
8) large numbers
9) C
10) B
11) C
12) B
13) C
14) B
15) D
16) B
17) B
18) A
19) C
20) B
21) B
22) D
23) B
24) A
25) D
26) D
27) B
28) C
29) C
30) B
31) A
32) C
33) C
34) A
35) C
36) B
37) B
38) B
39) B
40) B
41) A
42) C

43) B
44) B
45) C
46) C
47) B
48) A
49) C
50) D
51) C
52) C
53) C
54) D
55) C
56) A
57) B
58) C