

# QUIZ 2: 60 Minutes

Last Name: \_\_\_\_\_

First Name: \_\_\_\_\_

RIN: \_\_\_\_\_

Section: \_\_\_\_\_

Answer **ALL** questions.

**NO COLLABORATION** or electronic devices. Any violations result in an **F**.  
**NO questions** allowed during the test. Interpret and do the best you can.

## GOOD LUCK!

**10 Questions**

Circle at most one answer per question.

**10 points** for each correct answer

<b>Total</b>
<b>100</b>

1. How many guests do you need at a party to guarantee that two will be born on the same day of the week?
- A 3
  - B 5
  - C 7
  - D 8
  - E Not possible
2. How many guests do you need at a party to guarantee that two will be born on a Monday?
- A 3
  - B 5
  - C 7
  - D 8
  - E Not possible
3. How many numbers in the set  $\{1, 2, 3, \dots, 1000\}$  are divisible by 2 or 3.
- A 657
  - B 660
  - C 667
  - D 830
  - E 833
4. How many different words can you get by rearranging the letters of the word BOOKKEEPER?
- A  $10!$
  - B  $\frac{10!}{2! \times 2! \times 3!}$
  - C  $\binom{10}{6}$
  - D  $6^{10}$
  - E  $10^6$
5. You have 11 players and must form two teams of 5 for a practice match. How many different practice matches are possible. (Be careful! **TINKER**: for example, try 3 players forming two teams of 1)?
- A 1386
  - B 1388
  - C 1390
  - D 2772
  - E 2774

6. You randomly pick an 8-bit sequence (independent bits and each bit is 1 with probability  $\frac{1}{2}$ ). What is the probability that the sequence starts and ends in 1?

A  $\frac{1}{2}$

B  $\frac{1}{4}$

C  $\frac{1}{8}$

D  $\frac{1}{16}$

E  $\frac{1}{32}$

7. A box contains 10 coins. 9 are *fair* and 1 has *two heads*. You pick a coin at random. You toss it three times. What is the probability of tossing three heads (HHH)?

A  $\frac{1}{8}$

B  $\frac{15}{80}$

C  $\frac{16}{80}$

D  $\frac{17}{80}$

E  $\frac{18}{80}$

8. A box contains 10 coins. 9 are *fair* and 1 has *two heads*. You pick a coin at random. You toss your coin three times and get HHH. What is the probability that the coin you picked is fair?

A  $\frac{9}{10}$

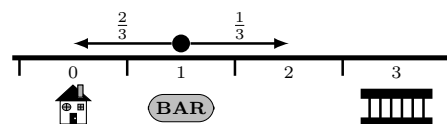
B  $\frac{8}{17}$

C  $\frac{9}{17}$

D  $\frac{10}{17}$

E  $\frac{11}{17}$

9. A drunk leaves the bar (at position 1), and takes independent steps: left (L) with probability  $\frac{2}{3}$  or right (R) with probability  $\frac{1}{3}$ . What is the probability the drunk reaches home (at position 0) before reaching the lockup (at position 3)?



- A  $\frac{1}{2}$
- B  $\frac{2}{3}$
- C  $\frac{4}{5}$
- D  $\frac{5}{6}$
- E  $\frac{6}{7}$

10. You roll 4 independent fair dice. What is the probability that you roll exactly *one* 2 and *one* 4?

- A  $\frac{3}{27}$
- B  $\frac{4}{27}$
- C  $\frac{5}{27}$
- D  $\frac{6}{27}$
- E  $\frac{7}{27}$

SCRATCH