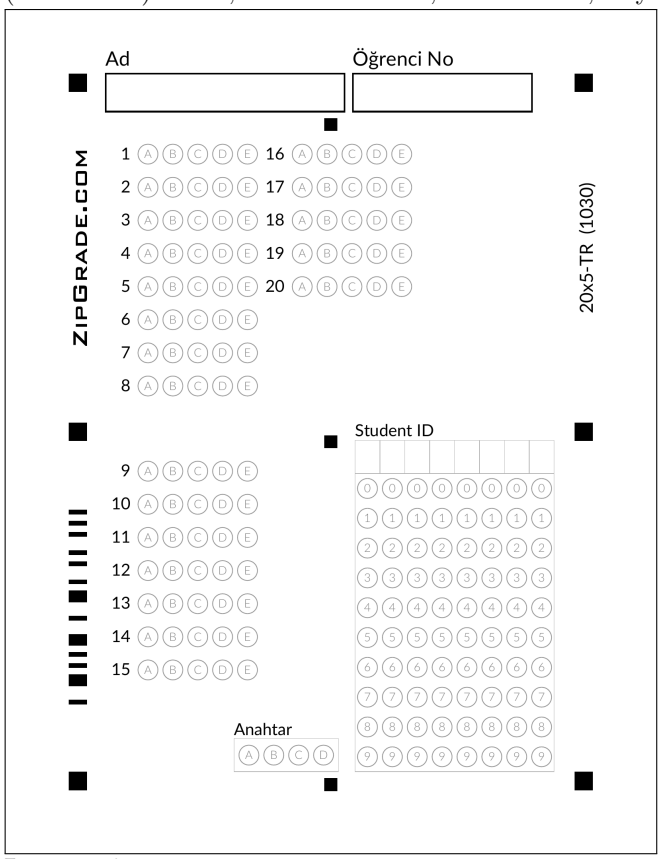
BLM2011 Statistics and Probability Calculations, Make-up (Bütünleme) Exam, 2023 - 2024 Fall, 22 Dec 2023, Key A



Instructions:

- Mark your answers on the answer key. Do not write/draw anything other than answer markings in the answer key area, as it can confuse the optical scanner.
- Scratch paper can be used. Submit your scratch paper at the end of the exam. Taking it outside is prohibited.
- You can make scratch notes on the question paper, but do not make any markings that indicate your answer. Such markings will be treated as an attempt to cheat (points for that question will be canceled). Similarly, do not write/make markings on the scratch paper that match a question with its answer. It will be treated in the same manner.
- Write and mark your name and number in the relevant fields on the answer key. Make sure you have correctly marked the 'Key' field on the answer key. The exam will be read optically.
- You may ask for the meanings of words you do not know in English/Turkish. You can ask questions you do not understand.
- There may be incorrect questions. Report any questions you suspect to the exam supervisor. They will be checked after the exam and canceled if there is an error. Sometimes the same answer is inadvertently printed for more than one option. In this case, mark the alphabetically first option and inform the exam supervisors. They will adjust the reader program accordingly.
- Calculators can be used.
- All questions are worth equal points.
- Standard Normal Distribution Cumulative Distribution Values: $\Phi(-1) \approx 0.16$, $\Phi(1) \approx 0.84$, $\Phi(2.24) \approx 0.98$, $\Phi(2.18) = 0.9854$, $\Phi(2.29) = 0.9890$
- Standard Normal Distribution Quantiles(Z-scores): $z_{0.10} = \Phi^{-1}(0.90) = 1.282$, $z_{0.05} = 1.645$, $z_{0.025} = 1.960$, $z_{0.01} = 2.326$, $z_{0.005} = 2.576$.

Questions (Each equal in points):

1. A company offers a referral bonus program. For each referred employee who stays at least 6 months, the referrer gets 500 dollars. If the probability that a referred employee stays for 6 months is 0.4, what is the expected bonus for referring one employee in dollars?

   A. 200 B. 500 C. 100 D. 0

   Solution: The expected bonus is $E(X) = 0.4 \times 500 = 200$ dollars.

2. A basketball player has a 70 percent chance of making each free throw. If she takes 10 free throws, what is the expected number of free throws she will make?

   A. 7 free throws B. 3 free throws C. 10 free throws D. 5 free throws

   Solution: The expected number is $E(X) = np = 10 \times 0.7 = 7$ free throws.

3. A taxi company charges a flat rate of 3 dollars plus 2 dollars per mile. If the distance of a ride follows a uniform distribution between 1 and 5 miles, what is the expected cost of a ride in dollars?

   A. 9 B. 8 C. 10 D. 7

   Solution: The expected distance is the mean of the uniform distribution, $\frac{1+5}{2} = 3$ miles. Thus, the expected cost is $3 + 2 \times 3 = 9$ dollars.