
Question 1 (10 pts): A friend asks to borrow \$250 and agrees to repay it in 30 days with 5% interest. How much interest will you earn? Round your answer to two decimal places.

Question 2 (10 pts): Suppose your city is building a parking garage, and issues bonds to raise the money to build it. You obtain a \$3,000 bond that pays 4% interest annually that matures in 5 years. Round your answer to two decimal places.

Question 3 (10 pts): An account earns an annual rate of 7.0% compounded weekly. If \$4,500 is deposited into this account, then after 6 years there is \$____. Round your answer to two decimal places.

Question 4 (10 pts): A parent wants to save up for their newborns college education. They assume college will cost \$105,000 in 18 years from now. If they make a single lump sum deposit into an account that has an annual rate of 7.9% compounded continuously, then what should that deposit be to reach the goal? Round your answer to two decimal places.

Question 5 (10 pts): You want to save up \$15,000 to purchase a used car in 4 years. Your account earns an annual rate of 5.3% compounded monthly. How much do you need to deposit each month to meet your goal? Round your answer to two decimal places.

Question 6 (10 pts): You know you will have \$450,000 in your account when you retire. You want to be able to take monthly withdrawals from the account for a total of 30 years. Your retirement account has an annual rate of 6.2% compounded monthly. What is the maximum amount you will be able to withdraw each month to deplete the account after 30 years. Round your answer to two decimal places

Question 7 (10 pts): You can afford \$375 per month as a car payment. If you can get an auto loan at 7.1% interest for 60 months (5 years), how expensive of a car can you afford? In other words, what amount loan can you pay off with \$375 per month? Round your answer to two decimal places.

Question 8 (10 pts): A corporation estimates it will need \$1,000,000 in 4 years to replace its existing machinery. How much should it deposit each quarter at an annual rate of 6.3% compounded quarterly to meet this obligation? Round your answer to two decimal places.

Question 9 (10 pts): An OB/GYN physician in private practice knows her malpractice insurance will be \$90,000 and is due in one year. How much should she deposit into an account each month if that account has an annual rate of 4.2% compounded monthly and she wishes to pay it in full knowing that the insurance company drops the price by 2% if paid in full? Round your answer to two decimal places. Hint: Lower the price by 2% as she is planning on paying in full.

Question 10 (10 pts): The state will collect data on students in all of the districts. Which of the following variables are quantitative? Select all that apply.

- 1) Grade point average.
- 2) Whether the student has taken the SAT.
- 3) Class (freshman, soph., junior, senior)
- 4) The number of absences from school.
- 5) Whether the student is in AP* classes.

Question 11 (10 pts): As part of a school project students will be randomly sampling from the students in the class. The assignment is to estimate the proportion of students who play on a sports team. Each student will randomly select 7 students. One student found out that 2 of the 7 play a sport. The teacher has collected data from all students and found that out of the 31 students in the class 19 of them played sports. Give the statistic for the percentage of students who play sports. Round your answer to two decimal places.

Question 12 (10 pts): Choose the most appropriate concept for the statement from the list below. "Tosha chose a simple random sample of 50 cell phones, and 9 of the phones were defective. Thomas chose a simple random sample of 50 cell phones, and 3 of the phones were defective."

Choose the correct answer.

- 6) Selection Bias.
- 7) Placebo Effect
- 8) Sampling Variability.
- 9) Confounding.

Question 13 (10 pts): Name the sampling method that best fits the scenario below. A student in a large lecture class wants to know how the rest of the class did on the last exam. She asks several of the students to share their score who are sitting around her. Based on that information she concludes she did fairly well.

Choose the correct sampling method below.

- 10) Simple Random Sample.
- 11) Quota Sampling.
- 12) Stratified Random Sampling.
- 13) Convenience Sampling.
- 14) Cluster Sampling
- 15) Census

Question 14 (10 pts): More dogs are being diagnosed with thyroid problems than have been diagnosed in the past. A researcher identified 50 puppies without thyroid problems and kept records of their diets for several years to see if any developed thyroid problems. This is a(n)

- 16) An Experiment
- 17) An Observational Study
- 18) A Simple Random Sample
- 19) None of the above.

Question 15 (10 pts): A clinical study was conducted on the effectiveness of a new knee surgery to cure a specific type of arthritis. Of the 219 individuals who met the inclusion criteria, 114 declined to participate. The researchers randomly divided the remaining 105 subject into three groups: One group received type A knee surgery; and the second group received type B knee surgery; a third group received skin incision to make it look like they had received knee surgery, but no actual surgery was performed. The patients in the study did not know which group they were in and in particular did not know if they were receiving the real surgery or simulated surgery. In a two-year follow up, all three groups said they had slightly less pain and better knee movement, but the "fake" surgery group often reported the best results.

Was the experiment blind, double blind, or neither.

Question 16 (10 pts): Double-blinding in experiments is important so that

- I. The evaluators do not know which treatment group the participants are in to avoid influencing the outcome of the experiment consciously or subconsciously in how they interact with participants.
- II. The participants do not know which treatment group they are in to avoid the placebo effect.
- III. No one knows which treatment any of the participants is getting to avoid letting patients choose which treatment they want to receive.

- 20) I only
- 21) II only
- 22) III only
- 23) I and II
- 24) I and III
- 25) II and III
- 26) I, II, and III

Question 17 (10 pts): A clinical study was conducted on the effectiveness of a new knee surgery to cure a specific type of arthritis. Of the 219 individuals who met the inclusion criteria, 114 declined to participate. The researchers randomly divided the remaining 105 subject into three groups: One group received type A knee surgery; and the second group received type B knee surgery; a third group received skin incision to make it look like they had received knee surgery, but no actual surgery was performed. The patients in the study did not know which group they were in and in particular did not know if they were receiving the real surgery or simulated surgery. In a two-year follow up, all three groups said they had slightly less pain and better knee movement, but the "fake" surgery group often reported the best results.

Which of the following represents the target population for this study.

- 27) The 105 subjects who participated.
- 28) All potential knee surgery patients who met the inclusion criteria.
- 29) The 219 individual who met the inclusion criteria for the study?
- 30) The subjects who fell into the two treatment groups (not those in the third group for whom no actual surgery was performed).