STATISTICS 2023 **NAME, IN INK**_____

EXAM TWO **SIGNATURE, IN INK**_____

FALL 2016 **CWID, IN INK**_____

Retain this exam for grade verification once it is graded and returned to you.
TRUE OR FALSE. Answer with a capital T or F. (4 points each)

_____ 1. The amount of water flowing per minute through an irrigation pump is a discrete random variable.

_____ 2. A continuous random variable is a variable that can be described as the number of success outcomes in n independent trials.

_____ 3. A probability mass function indicates how much probability is at each value of a discrete random variable.

_____ 4. The mean or expected value of a discrete random variable is a weighted sum of the values of the variable weighted by their probabilities.

_____ 5. If a variable has a standard normal distribution, then the mean of the variable is always zero and the standard deviation is always one.

_____ 6. The Binomial and the Poisson distributions are always right skewed.

STANDARD NORMAL DISTRIBUTION QUESTIONS. State the answer on the line provided. (4 points each)

_____ 7. Find z_o if $P(Z < z_o) = 0.16853$.

_____ 8. Find the $P(0.87 < Z < 1.56)$.

_____ 9. What is the $P(Z > - 0.48)$?

STATE THE ANSWER. State the answer on the line given. (4 points each)

_____ 10. Consider a lottery game in which a person can win $0, $1, or $2,000. If 98% of all the people who play win $0 and the probability of winning $1 is only 0.019, what is the expected winning amount in this lottery game? Round your answer to two digits past the decimal.

_____ 11. Assume that twenty percent of the files in certain computer system are contaminated with a computer virus, called VIRO. If you choose nine files at random what is the probability that fewer than three of them are contaminated with the computer virus, VIRO? State the answer with four digits past the decimal.

_____ 12. If on average the computer server serving your company's web page has 4 errors per hour, then what is the probability of either 5 or 6 errors in one hour? Round your answer to two digits past the decimal.

_____ 13. Assuming that the variable is a standard normal random variable, what is the probability that the variable has values within 1.75 standard deviations of the mean?

The amount of blood needed at a hospital during each twenty-four-hour period is uniformly distributed between the values of 800 pints and 1,800 pints. Use this information to answer the next three questions.

_____ 14. What is the expected amount of blood needed at this hospital in a twenty-four-hour period?

_____ 15. What is the probability that the hospital would need more than 1,500 pints of blood in a twenty-four-hour period?

_____ 16. To provide appropriate services, the hospital needs to have in storage the amount of blood needed for next twenty-four-hour period. How many pints of blood should they have in storage at the beginning of each twenty-four-hour period if they want to have enough blood in storage so that there is only a 5% chance of running out of blood in any twenty-four-hour period?

STATE THE ANSWER. State the answer on the line given. (4 points each)

Assume that the miles per full battery charge for a 2016 Tesla Model S electric car is a normally distributed random variable with a mean of 260 miles and a standard deviation of 20 miles. Use this information to answer the questions on this page.

_____17. Thirty-three percent of the time the Tesla Model S can go further than how many miles on a full battery charge?

_____ 18. Ninety-five percent of the time the Tesla Model S can go between how many miles on a full battery charge? Center the interval on the value of the mean and state the two values in the answer.

_____ 19. What is the value of the 50^{th} percentile for the miles from a full battery charge?

_____ 20. What is the probability that the Tesla Model S can go further than 224.6 miles on a full battery charge?

_____ 21. Only 1.5% of the time the Tesla Model S will go less than how many miles on a full battery charge?

STATE THE ANSWER. State the answer on the line given. (4 points each)

Assume 400 observations were randomly drawn from a population of investment returns with a mean of 65 dollars and a standard deviation of 50 dollars. Use this information to answer the remaining questions.

_____ 22. What is the standard deviation of all possible sample means that would result from the above situation?

_____ 23. Only 2.5% of the sample means that result from the above sampling situation will be less than what value?

_____ 24. What is the probability that the sample mean that results from the above situation will be between 66.25 and 70.5?

_____ 25. What is the probability that the sample mean that occurs from the above situation will be within 2.5 standard deviations of the population mean value of 65?

STANDARD NORMAL DISTRIBUTION: Table Values Represent AREA to the LEFT of the Z score.

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56749	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
2.0	.97725	.97778	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
2.1	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
2.2	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
2.3	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
2.4	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
2.5	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
2.6	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
2.7	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
2.8	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
2.9	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
3.0	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
3.1	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
3.2	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950
3.3	.99952	.99953	.99955	.99957	.99958	.99960	.99961	.99962	.99964	.99965
3.4	.99966	.99968	.99969	.99970	.99971	.99972	.99973	.99974	.99975	.99976
3.5	.99977	.99978	.99978	.99979	.99980	.99981	.99981	.99982	.99983	.99983
3.6	.99984	.99985	.99985	.99986	.99986	.99987	.99987	.99988	.99988	.99989
3.7	.99989	.99990	.99990	.99990	.99991	.99991	.99992	.99992	.99992	.99992
3.8	.99993	.99993	.99993	.99994	.99994	.99994	.99994	.99995	.99995	.99995
3.9	.99995	.99995	.99996	.99996	.99996	.99996	.99996	.99996	.99997	.99997