STATISTICS 2023 **NAME, IN INK**_____

EXAM TWO **SIGNATURE, IN INK**_____

FALL 2019 **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. Probability mass functions indicate how much of the mass of the unit one probability that occurs at each value of a discrete random variable.

_____ 4. If a variable has a standard normal distribution then the mean of the variable is always zero and the standard deviation is always one.

_____ 5. The Binomial and the Poisson distributions are always right skewed.

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

_____ 6. Find z_o if $P(Z < z_o) = 0.16847$.

_____ 7. Find the $P(0.87 < Z < 1.56)$.

_____ 8. What is the $P(Z > - 0.48)$?

_____ 9. What is the value of $z_{0.025}$?

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?

_____ 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. Twelve percent of the steel beams made by US Steel during one month were found to be 1/64 of an inch too wide. If you purchased eight of the beams made during that month to use in a bridge construction what is the probability that at most one of the beams you purchased were found to be 1/64 of an inch too wide? Round your answer to five digits past the decimal.

_____ 13. 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.

The amount of blood needed at a hospital during each twenty-four hour period is uniformly distributed between the values of 1,200 pints and 2,800 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 1,600 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 2% 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)

The fuel consumption of a certain type of car measured in miles per gallon (mpg) is normally distributed with a mean of 44mpg and a standard deviation of 2mpg. Use this information to answer the next five questions.

_____17. Thirty-three percent of the time this type of car has miles per gallon greater than what specific mpg value?

_____ 18. Ninety five percent of the time this type of car has fuel consumption between what two mpg values? State the two values centered around the mean that contains 95% of the values.

_____ 19. What is the value of the 50^{th} percentile for the distribution of fuel consumption measured in miles per gallon (mpg)?

_____ 20. What is the probability that this type of car exceeds 47.3mpg?

_____ 21. Only 1.5% of the time this type of car has fuel consumption that is less than how many miles per gallon (mpg)?

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 numerical value of the mean of all possible sample means that would result from the above situation?

_____ 23. What is the numerical value of the standard deviation of all possible sample means that would result from the above situation?

_____ 24. Only 0.57% (or 0.0057) of the sample means that result from the above sampling situation will be less than what value?

_____ 25. What is the probability that the sample mean that results from the above situation will be between 63.75 and 70.5?

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