UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Statistics & Applied Probability

PSTAT 122 FINAL EXAM

Thursday June 11, 8:00 a.m. - Friday June 12, 8:00 a.m. 2020

General Instructions

Answer both questions. All work must be your own. You may use any reference books or notes. Evidence of collaboration with other students will be severely penalized.
Each question should be answered in the form of a brief report (1 - 3 pages), with printed text explaining such things as: notation and formulae, which model and methods you used and why, results and interpretations, conclusions. Please include the corresponding ANOVA table in your report, for each question. Tables and graphs should be clearly labeled. Answers written on computer output are not acceptable. In additional to your brief report, you should include your R printouts in an appendix to support your findings. Please note, those two questions are open-ended questions. You should work on those data sets as deep as possible and I will evaluate your work accordingly.

Please carefully read the "General Instructions" on page 1 before you start

(30%) 1. Six new brands (A, B, C, D, E, and F) of fertilizer that a farmer can use to grow crops just came on the market. Before deciding which brand he should use permanently for all crops, a farmer decided to experiment for one season. To do so, he randomly assign each fertilizer to five one-acre tracts of land that he used to grow wheat. The following table gives the production of wheat (in bushels) for each acre for six brands of fertilizer.

Fertilizer A	Fertilizer B	Fertilizer C	Fertilizer D	Fertilizer E	Fertilizer F
73	75	69	68	69	80
70	82	67	77	63	87
71	82	76	76	65	86
65	80	74	73	65	84
76	86	74	71	58	78

Analyze the data and report your findings. Use $\alpha = 0.05$ for any tests performed to support your findings.

(70%) 2. An engineer is designing a battery for use. He has three possible plate materials to use. He is aware that temperature may affect the effective battery life and decides to test all three plate materials at three temperature levels (15, 70 and 125 ^oF). The experiment and the resulting observed battery life (in hours) are given below.

	Temperature (^oF)					
Material Type	15		70		125	
I	147	153	182	178	128	124
' II	157	161	144	150	121	119
III	132	126	156	162	109	107

Analyze the data and report your findings. Use $\alpha = 0.05$ for any tests performed to support your findings.