Please assist me with the below problems. Excel, graphs and word document each of the following problems must show steps.

1. (a) A random sample of n = 12 E-glass fiber test specimens of a certain type yielded a sample mean interfacial shear yield stress of 34.8 and a sample standard deviation of 4.1. Assuming that interfacial shear yield is normally distributed, compute a 98% C.I. for the true average stress. (Ref: “ On Interfacial Failure in Notched Unidirectional Glass/Epoxy Composites,” *J. of Composite Materials*, 1985: 276-286).

(b) The article “Statistical Evidence of Discrimination” (*J. Amer. Stat. Assoc.,* 1982: 773-783) discusses the court case *Swain v. Alabama* (1965), in which it was alleged that there was discrimination against blacks in grand jury selection. Census data suggested that 24% of those eligible for grand jury service were black, yet a random sample of 1075 called to appear for possible duty yielded only 181 blacks. Using a significance level of 0.01, does this data argue strongly for a conclusion of possible discrimination?

1. (a) The performance ratings of two sports cars, the Mazda RX7 and the Nissan 300ZX, are to be compared. A random sample of 30 drivers is selected to drive the two models. Each driver tries one car of each model, and the 30 cars of each model are chosen randomly (i.e. we can assume a completely randomized design). The time of each test drive is recorded for each driver and model. The difference in time (Mazda time – Nissan time) is computed for each driver. From these differences a sample mean and sample standard deviation are obtained. The results are Dbar = 1.0 seconds and sD = 2.1 seconds. Based on these data does the Mazda seem to have better performance? Explain. Also give a 90% confidence interval for the average time difference, in seconds, for the two models over the course driven.

(b) The article “Origin of Precambrian Iron Formations” (*Econ. Geology*, 1964: 1025 – 1057) reports the following data on total Fe for four types of iron formation (1 = carbonate, 2 = silicate, 3 = magnetite, 4 = hematite).

Type 1 Type 2 Type 3 Type 4

20.5 26.2 29.5 36.6

25.7 33.9 26.2 33.2

28.1 23.9 34.0 44.3

25.3 17.0 29.9 34.2

27.3 26.1 27.5 34.2

27.1 26.7 29.5 33.0

27.0 20.1 29.4 30.4

20.5 23.6 30.0 36.4

28.0 23.6 27.9 31.5

31.3 24.8 35.6 25.6

Carry out a complete analysis using ANOVA and a 5% significance level.