HW #11

Please, write clearly and justify all your steps, to get proper credit for your work.

(1) State DMV records indicate that of all vehicles undergoing emissions testing during the previous year, 70% passed on the first try. A random sample of 200 cars tested in a particular county during the current year yields 160 that passed on the initial test. Does this suggest that the true proportion for this county during the current year differs from the previous statewide proportion? Test the relevant hypotheses using $\alpha = 0.05$.

(2) A university library ordinarily has a complete shelf inventory done once every year. Because of new shelving rules instituted the previous year, the head librarian believes it may be possible to save money by postponing the inventory. The librarian decides to select at random 1000 books from the librarys collection and have them searched in a preliminary manner. If evidence indicates strongly that the true proportion of misshelved or unlocatable books is less than .02, then the inventory will be postponed. Among the 1000 books searched, 15 were misshelved or unlocatable. Test the relevant hypotheses and advise the librarian what to do (use $\alpha = 0.05$).

(3) A plan for an executive travelers club has been developed by an airline on the premise that 5% of its current customers would qualify for membership. A random sample of 500 customers yielded 40 who would qualify. Using this data, test at level .01 the null hypothesis that the companys premise is correct against the alternative that it is not correct.

(4) The times of first sprinkler activation for a series of tests with fire prevention sprinkler systems using an aqueous film-forming were (in sec):

28, 42, 23, 28, 24, 36, 31, 34, 25, 28, 29, 23, 25.

The system has been designed so that true average activation time is at most 25 sec under such conditions. Does the data strongly contradict the validity of this design specification? Test the relevant hypotheses at significance level .05.

(5) Solve problems 20, 25(a), 34(a) from Sec.8 (p.321-323).