**Compiler Design Lab Supply Exam**

**Time : 2 Hrs**

**Max Marks : 40 [4\*10]**

1. Write a lex description for the language of all strings of alphabets a...z, A…Z that have no alphabet repeated. (Example: abcAd is not allowed since the ‘a’ is repeated). Your lexical analyzer should print "ACCEPT" or "REJECT", as appropriate.
2. The TOY program input file consists of a sequence of lines. If a line begins with two hex digits xy, followed by a colon, followed by a space, followed by four hex digits abcd, then we load instruction abcd in to memory location xy. Otherwise we, ignore the line. Write a lex program to parse each line.
3. Phone numbers are customarily written with separator characters. In a variety of situations, these need to be removed for processing or storage in database. Write a program in Lex that will remove parenthesis, periods, dashes and white space from a given phone number.
4. Write a Lex program that takes strings over {X, V, I} as input, and that accepts if and only if the input is a valid Roman numeral. A string is a valid Roman numeral if and only if it is non-empty and has the following form:

A sequence of 0 to 3 "X"s followed by one of "IX" or "IV" /or 0 or 1 "V"s followed by 0 to 3 "I"s.

For example, "XIV" is a valid Roman numeral because it begins with 1 "X", followed by "IV". "XXI" is valid because it consists of 2 "Xs" followed by 0 "Vs" and 1 "I". However, "XVX" is not valid, because nothing in the above rules allows a "V" to be followed by an "X."