Q1/ Write a prolog program that split a list of integer values in to two lists the first list of prime number and the second with the non prime. Such as: \text{split([2,3,4,5,6,7,9,1011],L1,L2)}, \text{The output should be } L1=[2,3,5,7,11] \hspace{1em} L2=[4,6,9,10].

Q2/ Write a prolog program that delete the middle items from a list of integer values such as:
\text{delete(M,[1,2,3],R).} \hspace{1em} R=[1,3]. and: \text{delete (M, [[1,2,3,4],R).} \hspace{1em} R= [1,4].

Q3/ Trace the following clauses, Assume the goal is \text{w(S)}:
\begin{align*}
\text{r(1).} \\
\text{r(2).} \\
\text{c(7,2).} \\
\text{g(X,Y):-c(X,Y),l,c(M,N),y=(M+N)/2,Z=round(Y).} \\
\text{w(F):-g(A,B),F=(B-A) mod 3.}
\end{align*}

Q4/ If you know that the predicates part of the program is correct, Specify the errors in the other parts of the program, then rewrite the correct program to make the program produce the following output:
\text{L=['r','e','a','d']}. 

Q5/ Write the mathematical operations or the string functions for five from the following operations, show with example:
1- Find the length of a string.
2- Convert any char to its integer value.
3- Return the logarithm to a specific integer value.
4- Ignore the fraction from a float number.
5- Return the tangent of its argument
6- Convert the string in the Capital letter to the small letter and the opposite.

Q6/ Write a prolog program by using the database to add records about employs, each record consist of employ name, employ age and employ address such as:
\begin{align*}
\text{Employ(Ahmed,32,Baghdad).} \hspace{1em} \text{Employ(Ali,25,Arbil).} \hspace{1em} \text{Employ (laith,40,Baghdad).} \\
\text{Employ (Hassan, 23,Arbil).} \hspace{1em} \text{Employ (Ahmed,50,Baghdad)}
\end{align*}
Then do the following:
1- Input these records to the employ database, then save the database under name “employ”.
2- Return all employ name whose age >30, put them in a list.
3- Delete all employs whose address=Arbil.
Q7/ Write a prolog program that read the content from a file then find:
   - How many the syllable "ing" is iterated.
   - How many sentences are in the file?
   - How many vowel letters are in the file?

Q8/ Draw the semantic Net for the following paragraph:
1- Suha like a diet cheese, she cuts it with a knife every morning for breakfast, she always prepare the breakfast to her family, her family consist of father, mother and brother, Ali is suha’s brother, he love her sister but he don’t lik a diet cheese.

Q9/ Using Forward chaining to find that if the goal (Z) is true or not.
q(1). p(2). x(3) y(1). a.
r:- q(A), P(B).
z:- a, not (F), not (p(3)), w.
w:- x (Z), y (L), not(q(2)), r.

Q10/ TO successfully design and implemented a search algorithm? It should be produced answers to many questions to be accepted from the analyzer? What are these questions?

Q11/ Write a complete prolog program to calculate the quadratic equation:
\[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]

Q12/ Using Depth First search to find the path from (A-H)

| GOOD LUCK |