Ain Shams University
Artificial Intelligence
Fourth Year Second Semester
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Answer all questions

1. a) What is the difference between knowledge acquisition and knowledge elicitation? List some of knowledge elicitation techniques?
   b) Draw a diagram and discuss the spiral model for expert system development.
   c) Consider the following rules:
   Rule1: if the engine is getting gas, and the engine will turn over, then the problem is spark plugs.
   Rule2: if the engine does not turn over, and the lights do not come on, then the problem is battery or cables.
   Rule3: if the engine does not turn over, and the lights do come on then the problem is the starter motor.
   Rule4: if there is gas in the fuel tank, and there is gas in the carburetor then the engine is getting gas.
   Suppose *gas in the fuel tank = yes, gas in the carburetor = yes, and the engine will turn over = yes*, simulate the following:
   i) The back chain and its explanation model by the goal "*the problem is X*".
   ii) The forward chain

2. a) Write the unification algorithm of two terms
   b) For each of the following pairs of terms, give output of the unification if they unify or else explain why unification would fail:
   i) a and A.
   ii) a and b
   iii) a and a
   iv) add(B, g(2,3),L)) and add(Y,g(Z,X),g(Z.X_1))
   v) g(A) and g(h(A))
   c) Given the following
   i) if it is cloudy and it is cold, then Aly is sad.
   ii) it is cloudy if it is raining.
   iii) it is raining.
   iv) it is cold.
   v) is Aly sad?
   Use resolution to show Aly is sad

3. a) What is the difference among the data, information, and knowledge?
   b) Given the following prolog predicates that compute the fibonacci number:

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fib(0, s(0)).
fib(s(0), s(0)).
fib(s(s(X)), W):-
        fib(s(X), U), fib(X, V), plus(U, V, W).

plus(0, X, X).
plus(s(X), Y, s(Z)):-
        plus(X, Y, Z).
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   What is the value of the variable F after proving the goal:

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?- fib(s(s(s(0))), F).
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