



Answer ALL questions.

Q1.

- a. Using the truth tables check whether the following formulas are holding the statement, “The following formula is Invalid yet consistent (satisfiable)”.

(i)

(ii)

- b. The given propositions are as follows.

Build the compound propositions according to the given statements below by using the Propositional Logic Formulas.

- (i) “I go out with friends if I finish my homework”

- (ii) “I go out with my friends if and only if I finish my homework and It’s a sunny day, or I don’t go out with friends”

- c. Translate the following statements using First Order Logic.

- (i) All students are studying

- (ii) Not all students pass the exams

- d. Identify the bound and free variables from the following formulas.

(i)

(ii)

Q2.

- a. Define the term **Intelligent Agent** in brief with the help of an example.
- b. Briefly explain Simple Reflex Agents and Model-Based Reflex Agents. And which is the most suitable agent type to handle the partial observability.

c. Write the output for the following PROLOG codes.

- (i) `?- 6+4:=6*3-8`
- (ii) `?- 6+4==6*3-8`
- (iii) `?- X=alex, read(person)`  
`|: martin.`

d. The following five clauses are present in the given database.

```
person(john, smith, 45, london) .  
person(mary, jones, 28, edinburgh) .  
person(michael, wilson, 62, bristol) .  
person(mark, smith, 37, cardiff) .  
person(henry, roberts, 23, london) .
```

What will be the output for following queries

- (i) `?- findall(S, person(_, S, _, _), L1) .`
- (ii) `?- findall(A, person(_, _, A, _), L2) .`

### Q3.

a. Explain the following terms in your words.

- (i) Problem formulation
- (ii) Goal formulation

b. A problem can be defined by using four components.

- (i) Write those four components.
- (ii) Define Blocks World domain with the help of those components.

c. Problem solving performance of an algorithm can be evaluated in four ways; Briefly explain them.

d. Briefly explain Bidirectional Search in your words. It will become **Complete** and **Optimal** if both search strategies become which uninformed search strategy?

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