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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Fundamentals of Artificial intelligence (course)[Announcements \(announcements\)](#) [About the Course \(preview\)](#) [Q&A \(forum\)](#) [Progress \(student/home\)](#) [Mentor \(student/mentor\)](#)[Review Assignment \(assignment_review\)](#) [Course Recommendations !\[\]\(cf531ed27e91483460120fcc057b3901_img.jpg\) \(/course_recommendations\)](#)

Course outline

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online course work? \(\)](#)[Week 0: Prerequisites
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Assignment 4

The due date for submitting this assignment has passed.**Due on 2024-08-21, 23:59 IST.**

Assignment submitted on 2024-08-21, 22:56 IST

1) A physical symbol system has the necessary and sufficient means for general intelligent action. Identify the correct statements with regards to Symbol System Hypothesis **1 point**

- ☒ A. Knowledge may be represented as symbol structures.
- ☐ B. Represents a computational system inspired by the human brain.
- ☐ C. Intelligent behaviour cannot be achieved through manipulation of symbol structures.

Week 2: Problem Solving by Search - I ()

Week 3: Problem Solving by Search - II ()

Week 4: Knowledge Representation and Reasoning - I ()

- ☐ Lec 1: Introduction to Knowledge Representation (unit?unit=32&lesson=33)
- ☐ Lec 2: Propositional Logic (unit?unit=32&lesson=34)
- ☒ Lec 3: First Order Logic -I (unit?unit=32&lesson=35)
- ☒ **Quiz: Assignment 4 (assessment?name=143)**
- ☒ Feedback Form (unit?unit=32&lesson=36)

Week 5: Knowledge Representation and Reasoning - II ()

Week 6: Knowledge Representation and Reasoning - III ()

☒ D. Human thinking is a kind of symbol manipulation.

Yes, the answer is correct.

Score: 1

Accepted Answers:

A. *Knowledge may be represented as symbol structures.*

D. *Human thinking is a kind of symbol manipulation.*

2) Identify the correct combination of terms and definitions below.

1 point

Terms	Definition
P. data	X. primitive verifiable facts, of any representation.
Q. information	Y. relation among sets of data, that is very often used for further information deduction.
R. knowledge	Z. interpreted data

☒ A. P:X; Q:Z; R:Y

☐ B. P:Y; Q:Z; R:X

☐ C. P:X; Q:Y; R:Z

☐ D. P:Y; Q:Z; R:X

Yes, the answer is correct.

Score: 1

Accepted Answers:

A. *P:X; Q:Z; R:Y*

3) A proposition in a KR language does not mean anything on its own. The _____ (i.e. the meaning) of the proposition must be defined by the language author through _____. **1 point**

☒ A. semantics; an interpretation

☐ B. interpretation; a semantics

☐ C. inference, a proof.

☐ D. semantics; theorems

Yes, the answer is correct.

Score: 1

Accepted Answers:

A. *semantics; an interpretation*

Week 7: Reasoning under Uncertainty ()

Week 8: Planning ()

Week 9: Planning and Decision Making ()

Week 10: Machine Learning -I ()

Week 11: Machine Learning - II ()

Week 12: Machine Learning - III ()

Text Transcripts ()

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4) Which of the following statements are true for Closed World Assumption?

1 point

I. Every constant refers to a unique object.

II. Atomic sentences not in the database are assumed to be false.

- ☐ A. Neither Statement I nor II
- ☐ B. Both Statement I and II
- ☐ C. Statement I only
- ☒ D. Statement II only

No, the answer is incorrect.

Score: 0

Accepted Answers:

B. Both Statement I and II

5) Consider which of the following statements are correct w.r.t. satisfiability of logical sentences based on the logical operators involved.

1 point

I. Universally quantified sentence is satisfied if and only if the enclosed statement is satisfied for all assignments of the quantified variable.

II. Existentially quantified sentence is satisfied if and only if the enclosed statement is satisfied for some but not all assignments of the quantified variable.

- ☐ A. Both I and II
- ☐ B. Either I or II
- ☒ C. I only
- ☐ D. II only

Yes, the answer is correct.

Score: 1

Accepted Answers:

C. I only

6) Assertion A: Propositional Logic is a weak Language.

1 point

Reason R: In propositional logic, it is hard to identify "individuals"; can't directly talk about properties of individuals or relations between

individuals; and generalizations, patterns, regularities can't easily be represented.

Mark the correct choice as

- ☒ A. Both A and R are true and R is the correct explanation for A
- ☐ B. Both A and R are true but R is not the correct explanation for A.
- ☐ C. A is True but R is False
- ☐ D. A is false but R is True

Yes, the answer is correct.

Score: 1

Accepted Answers:

A. Both A and R are true and R is the correct explanation for A

7) Assertion A: A knowledge representation is fundamentally a surrogate.

1 point

Reason R: A knowledge representation is a substitute for the thing itself; used to enable an entity to determine consequences by reasoning about the world.

Mark the correct choice as

- ☒ A. Both A and R are true and R is the correct explanation for A
- ☐ B. Both A and R are true but R is not the correct explanation for A
- ☐ C. A is True but R is False
- ☐ D. A is false but R is True

Yes, the answer is correct.

Score: 1

Accepted Answers:

A. Both A and R are true and R is the correct explanation for A

8) Consider which of the following statements are correct w.r.t. nesting of quantifiers:

1 point

I. Switching the order of universal quantifiers does not change the meaning

$$\forall x \forall y P(x,y) \leftrightarrow \forall y \forall x P(x,y).$$

II. Similarly, one can also switch the order of existential and universal quantifiers

$$\exists x \forall y P(x,y) \leftrightarrow \forall y \exists x P(x,y).$$

- ☐ A. Both I and II
- ☐ B. Neither I or II
- ☒ C. I only
- ☐ D. II only

Yes, the answer is correct.

Score: 1

Accepted Answers:

C. I only

Consider the predicates listed below:

Professor(x) x is a Professor.

Person(x) x is a person.

Dean(x) x is a Dean.

Friend(x,y) x is a friend of y.

Know(x,y) x knows y.

Criticize(x,y) x criticizes y.

9) Translate the following English statement into First Order Logic statement.

1 point

All professors consider the dean a friend or do not know him.

- ☐ A. $\forall x (\exists y (Professor(x) \wedge Dean(y) \rightarrow Friend(x,y) \vee \neg Know(x,y)))$
- ☒ B. $\forall x (\forall y (Professor(x) \wedge Dean(y) \rightarrow Friend(x,y) \vee \neg Know(x,y)))$
- ☐ C. $\forall x (\exists y (Professor(x) \wedge Dean(y) \wedge Friend(x,y) \vee \neg Know(x,y)))$
- ☐ D. $\forall x (\forall y (Professor(x) \wedge Dean(y) \leftrightarrow Friend(x,y) \vee \neg Know(x,y)))$

Yes, the answer is correct.

Score: 1

Accepted Answers:

B. $\forall x (\forall y (Professor(x) \wedge Dean(y) \rightarrow Friend(x,y) \vee \neg Know(x,y)))$

10) Translate the following English statement into First Order Logic statement. Person only criticize person that are not their friends. **1 point**

- ☒ A. $\forall x (\forall y (Person(x) \wedge Person(y) \wedge Criticize(x,y) \rightarrow \neg Friend(y,x)))$
- ☐ B. $\forall x (\forall y (Person(x) \wedge Person(y) \rightarrow Criticize(x,y) \wedge \neg Friend(y,x)))$
- ☐ C. $\forall x (\forall y (Criticize(x,y) \rightarrow \neg Friend(y,x)))$
- ☐ D. $\forall x (\forall y (\neg Friend(x, y) \rightarrow Criticize(y, x)))$

Yes, the answer is correct.

Score: 1

Accepted Answers:

A. $\forall x (\forall y (Person(x) \wedge Person(y) \wedge Criticize(x,y) \rightarrow \neg Friend(y,x)))$