

## QUESTION: 01

Write any 15-20 FOL facts related to any domain.

Answer:

- 1- For all natural numbers  $n$ ,  $n$  is greater than 0.

FOL:  $\forall n (n > 0)$

- 2- In a triangle, the sum of angles is  $180^\circ$ .

FOL:  $\forall t (\text{Triangle}(t) \rightarrow (\angle A(t) + \angle B(t) + \angle C(t) = 180^\circ))$

- 3- Newton's second law states that force equals mass times acceleration.

FOL:  $\forall o (\text{Object}(o) \rightarrow (\text{Force}(o) = \text{Mass}(o) * \text{Acceleration}(o)))$

- 4- In binary search tree, all values in the left subtree are less than the root value.

FOL:  $\forall b (\text{BinarySearchTree}(b) \rightarrow (\forall n (\text{Node}(n, b) \rightarrow \text{Value}(n) < \text{Value}(b))))$

- 5- All English nouns can be pluralized by adding 's'.

FOL:  $\forall n (\text{English Noun}(n) \rightarrow \text{Pluralize}(n) = n + 's')$

- 6- Vaccination prevents certain diseases.

FOL:  $\forall d (\text{Disease}(d) \rightarrow \text{Prevents}(\text{Vaccination}, d))$

- 7- In most legal systems, the minimum age for voting is 18.

FOL:  $\forall l (\text{Legal System}(l) \rightarrow \text{Minimum Voting Age}(l, 18))$ .

- 8- All planets in solar system orbit the Sun.

FOL:  $\forall p (\text{Planet}(p) \rightarrow \text{Orbit}(p, \text{Sun}))$

- 9- Chemical reactions involve the rearrangement of atoms.

FOL:  $\forall r (\text{Chemical Reaction}(r) \rightarrow \text{Rearrangement of Atoms}(r))$

- 10- Water consists of two hydrogen atoms and one oxygen atom.

FOL:  $\forall w (\text{Water}(w) \rightarrow (\exists h_1 \exists h_2 \exists o (\text{Atom}(h_1) \wedge \text{Atom}(h_2) \wedge \text{Atom}(o) \wedge \text{Composed of}(w, h_1, h_2, o))))$

- 11- All human beings have capacity of learning.

FOL:  $\forall h (\text{human}(h) \rightarrow \text{has capacity for Learning}(h))$

- 12- Beethoven composed the ninth Symphony.

FOL:  $\text{Composed by}(\text{Ninth Symphony}, \text{Beethoven})$

- 13- In a market, when demand exceeds supply, prices rise

FOL:  $\forall m (\text{Market}(m) \rightarrow (\forall p (\forall d (\forall s (\text{Product}(p) \wedge \text{Demand}(p, d, m) \wedge \text{Supply}(p, s, m) \rightarrow \text{Price Rise}(m))))))$

- 14- Adjectives modify nouns in a sentence.

FOL:  $\forall s (\text{Sentence}(s) \rightarrow (\forall a (\forall n (\text{adjective}(a) \wedge \text{Noun}(n) \wedge \text{Modifies}(a, n, s))))$

- 15- In basketball, teams consist of five players each.

FOL:  $\forall t (\text{Basketball Team}(t) \rightarrow (\text{Number of Players}(t) = 5))$



16- All oak trees are deciduous.

FOL:  $\forall o (\text{Oaktree}(o) \rightarrow \text{Deciduous}(o))$

17- Shakespeare's work includes 'Romeo and Juliet'.

FOL: Includes works (Shakespeare, "Romeo and Juliet")

18- River flows into larger bodies of water.

FOL:  $\forall r (\text{River}(r) \rightarrow (\exists l (\text{Largebodyofwater}(l) \wedge \text{Flows into}(r, l))))$

19- In United States, the Constitution is the supreme Law of the Land.

FOL: Supreme Law (Constitution, United States)

Students must pass all required courses to

20- graduate.

FOL:  $\forall s (\text{Student}(s) \rightarrow (\forall c (\text{Required Course}(c) \rightarrow \text{Passed}(s, c))))$