DSVV

# देव संस्कृति विश्वविद्यालय
## शान्तिकुन्ज, हरिद्वार

### आन्तरिक मूल्यांकन परीक्षा – INTERNAL EVALUATION TEST

**उत्तर-पुस्तिका**

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Signature of student's

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| लघुत्तरीय | | योग/Total |
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| A ) Short Answer Type | | |
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| B) Long Answer Type | | |
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Ans 1. Production System

A Production System is a kind of Cognitive architecture that is used to implement Search algorithms and replicate human Problem-solving skills.

features of Production System

- Simplicity - The structure of each Sentence is unique and uniform as they use "IF -THEN" structure.

- Modularity - Information Can be treated as a Collection of independent facts.

- modifiability - It allows the development of Production rules in a skeletal form first and then it is accurate to Suit a specific application.

- Knowledge intensive - Each Production rule is normally written as an English Sentence.

Advantages of Production System

- It helps to Create AI-based Computer Programs

- with the help of it, the automation of various types of machine has become an easy task.

- It helps the machine respond to the surroundings.

- Today, many expert Systems and automation methodologies rely on the rules of Production Systems.

## Disadvantages of Production System

- **Opacity** - This Problem is generated because of less Prioritization of rules.

- **Inefficiency** - As the rules of the Production System are large in number and they are hardly written in hierarchical manner.

- **Absence of learning** - Rule based Production Systems do not store the result of the Problem for future use.


## Ans 2 ANN - Artificial Neural Network.

- An Artificial Neural Network (ANN) is the Piece of a Computing System designed to Simulate the way the human brain analyzes and Processes information.

- It is the foundation of artificial intelligence and solves Problems that would Prove impossible or difficult by human or Statistical Standards.

- ANNs have Self-learning Capabilities that enable them to Produce better results as more data becomes available.

- ANNs are Considered non linear Statistical data modeling tools where the Complex relationships between inputs and outputs are modeled or Patterns are found.

- It's most recognized advantage is that it can actually learn from observing

data sets.

## Applications of ANN

- **Speech Recognition** - It maps the same kind of Phonemes as the output array. After extracting the features, with the help of some aloustic models as back-end processing, it will recognize the utterance.

- **Handwriting Recognition** - It became important due to hand held devices.

- **Image Compression** - vast amounts of information is relieved and Processed at once by neural networks. This makes it useful in image compression.

- **Stock Exchange Prediction** - This is done using Parameters such as Current trends, Political Situation, Public view, economists' advice, etc.
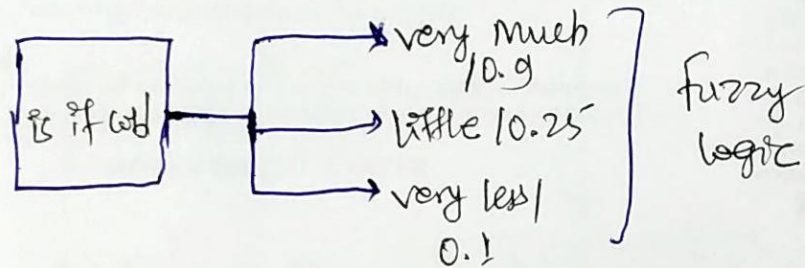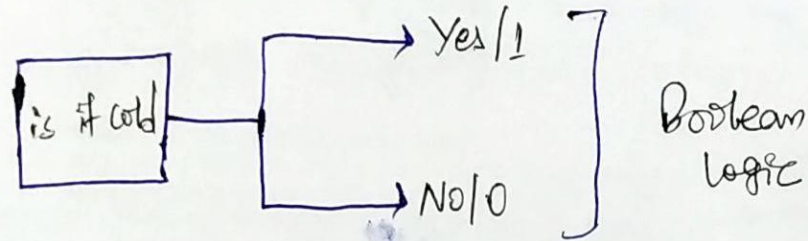
# Long Answer

**Ans 1 Fuzzy Logic -**

- fuzzy logic is an approach to variable Processing that allows for multiple values to be Processed through the Same variable.

- fuzzy logic attempts to solve Problems with an open, imprecise spectrum of data that makes it Possible to obtain an array of accurate Conclusions.

- fuzzy logic is designed to solve Problems by Considering all available information and making the best Possible decision given the input.

- Theoritically, this gives the approach more opportunity to mimic real-life Circumstances.

- fuzzy logic may be used by Quantitative analysts to improve execution of their algorithms.

**EX.**

- In boolean System, truth value, 1.0 represents absolute truth value and 0.0 represents absolute false value.

- but in fuzzy System, there is no logic for absolute truth and absolute false value.

- but in fuzzy logic, there is intermediate value too Present which is Partially true
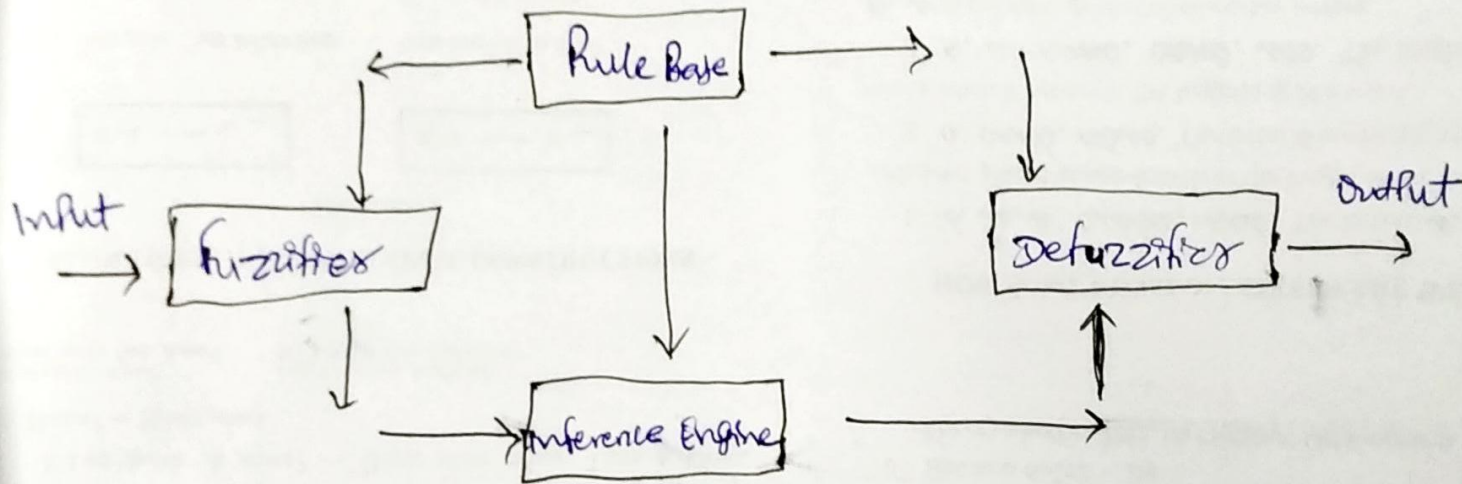
and Partially false.



fuzzy logic architecture

It's architecture Contains four Parts :-

• Rule Based - It Contains the set of rules and the if-THEN Conditions provided by the experts to govern the decision making system.

• Fuzzification - It is used to Convert inputs i.e. Crisp numbers into fuzzy sets.

• Inference engine - It determines the matching degree of the Current fuzzy input with respect to each rule and decides which rules are to be fired according to the input field.

- **Defuzzification** . It is used to convert the fuzzy sets obtained by inference engine into a crisp value.

```
                    ┌──────────┐ ─────────→
            ┌─────── │ Rule Base│ ────────→
            │        └──────────┘
            ↓             │              ┌──────────────┐    Output
  Input   ┌──────────┐    │              │  Defuzzifier │ ───→
   ───→   │ Fuzzifier│    │              └──────────────┘
          └──────────┘    │                     ↑
               │          ↓                     ↕
               ↓   ┌─────────────────┐          │
               └──→│ Inference Engine│ ─────────→
                   └─────────────────┘
```

### fuzzy logic architecture

Thus, we have seen that the fuzzy logic is a convenient way to map an input space to an output space.

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