COVID – 19 (ONLINE EXAMINATION)

DSVV

# देव संस्कृति विश्वविद्यालय

शान्तिकुन्ज, हरिद्वार

## आन्तरिक मूल्यांकन परीक्षा – INTERNAL EVALUATION TEST

**उत्तर-पुस्तिका**

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Student's Roll No. ( in numbers) Paper code

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कक्षा BCA (VI Semester) विषय Artificial Intelligence
Class Subject

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प्रश्न पत्र संख्या .....
Examination Paper Number

| लघुत्तरीय A) Short Answer Type | | योग/Total |
|---|---|---|
| 1 | 2 | |
| | | |
| दीर्घ उत्तरीय B) Long Answer Type | | |
| 1 | | |
| कुल योग अंकों में / TOTAL IN DIGITS | | |
| कुल योग शब्दों में/TOTAL IN WORDS ..... | | |

Aniket

परीक्षार्थी के हस्ताक्षर
Signature of student's

परीक्षक के हस्ताक्षर
Signature of Examiner

Ans 1. • AI (Artificial Intelligence) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions.

In other words,

• Artificial Intelligence is the branch of Computer Science that attempts to solve Problems for which there is no known efficient solution, but which we know are efficiently solvable, because some intelligence can solve the problem (often in "real time").

• The Goal of work in artificial intelligence to build machines that perform tasks normally requiring human intelligence.

• Pattern Recognition is the process of distinguishing and segmenting data according to set criteria or by common elements, which is performed by special algorithms.

• In other words, Pattern recognition is identifying patterns in data. These patterns tell the data stories through ebbs and flows, spikes, and flat lines.

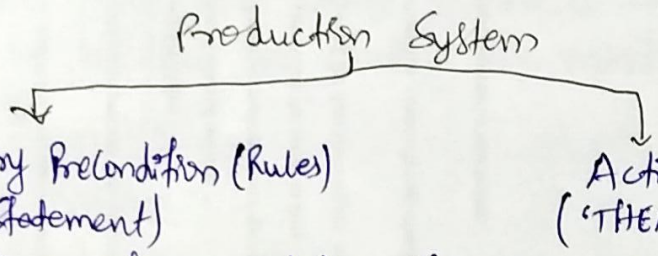
• The data itself can be anything - Text, Images, Sounds, Sentiments, etc.

• The Pattern can be recognized by -

gather data → Clean it from the noise → examine for similarities → group data into segments → analyze segments → Implement extracted insights.

Ans 2. • A Production System (Popularly known as a Production rule System), in AI is a type of Cognitive architecture that defines specific actions as per certain rules, that are used to implement search algorithms and replicate human problem-solving skills.

• The rules represent the declarative knowledge of a machine to respond according to different conditions.




• If a Production's precondition matches the current state of the world, then the Production is said to be triggered.

• If a Production's action is executed, it is said to have fired.

• Due to the use of IF-THEN structure, each sentence is unique in the Production System. The uniqueness makes the knowledge representation simple to enhance the readability of the Production rules.

• Rules recognize the condition, and the actions part has the knowledge of how to deal with the condition.

• In simpler words, condition — A set of things to watch.
action — things to do.

Long Answer

Ans 1. Problem formulation in AI

- Every Problem should be Properly formulated in artificial intelligence, as it is very important before applying any Search algorithm.
- It is the step in Problem Solving that is used to understand and decide a Course of action that needs to be Considered to achieve a goal.
- If there are more than one ways to reach the goal, then Proper Problem formulation would be helpful for chosing the most efficient way.

Steps of Problem formulation

1. Definition of the Problem
   - Differentiate fact from opinion.
   - State the Problem Specifically.
2. Determine Possible Solutions
   - Some Solution will be efficient than others, Some will Consume less resources, Some will be Simple, etc.
   - Include all involved individual's in the generating of alternatives.
   - Brainstorm on others' ideas.
3. Evaluate and Select a Solution
   - Evaluate all alternatives without bias

- Evaluate Solutions relative to established goals
- Evaluate both Proven and Possible outcomes.

4. Implement and follow up on the Solution
   - Evaluate long term results based on final Solution.

- we can say that, Problem formulation is all about deciding what actions and states to be Considered.

Problem formulation

formulate ⟶ Search ⟶ Execute.

# Components of Problem formulation:

- Problem Statement
  - Problem definition.
  - Problem limitation
- Problem Solution
- ~~Pro~~ Solution Space
- Operators

To understand it, we can look into an example.

Example - Mouse Path Problem

- Problem Statement
  - Problem definition - Mouse is hungry, mouse is in a puzzle where there are some cheeze.
  - Problem limitation - Some paths are close, i.e. dead end, mouse can only travel through open paths.
- Problem Solution - Reach location where there is cheese and eat minimum one cheese.
- Solution State - To reach cheese there are multiple paths possible.
- Operators - Mouse can move in 4 possible directions - UP, DOWN, left and right.