

Roll No.

Total No. of Pages : 04

Total No. of Questions : 14

**BCA (Sem.-6)**  
**ARTIFICIAL INTELLIGENCE**  
Subject Code : BCA-601  
Paper ID : A0225

Time : 3 Hrs.

Max. Marks : 75

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A will be compulsory and have 20 questions of 1 mark each.
2. SECTION-B will have 8 short answer type questions of 5 marks each, out of which candidate will have to attempt any 5.
3. SECTION-C will have 5 long answer type questions of 10 marks each, out of which candidate will have to attempt any 3.

**SECTION-A**

**1. Multiple Choice Questions :**

- A) Which of the following is a component of an expert system?
- |                     |                     |
|---------------------|---------------------|
| a. Inference engine | b. Knowledge base   |
| c. User interface   | d. All of the above |
- B) The first AI programming language was :
- |            |         |
|------------|---------|
| a. BASIC   | b. IPL  |
| c. FORTRAN | d. LISP |
- C) What is the name of the computer program that contains the distilled knowledge of an expert?
- |                               |                                  |
|-------------------------------|----------------------------------|
| a. Database management system | b. Management information system |
| c. Expert system              | d. Artificial Intelligence       |
- D) A production rule consists of
- |                   |                        |
|-------------------|------------------------|
| a. A set of rule  | b. A sequence of steps |
| c. Both a. and b. | d. Neither a. nor b.   |

- E) What are taken into account of state-space search?
- a. Postconditions
  - b. Preconditions
  - c. Effects
  - d. Both preconditions and effects
  - e. Both postconditions and effects
- F. Single inference rule is also known as
- a. Resolution
  - b. Reference
  - c. Both a. and b.
  - d. Neither a. nor b.
- G. What is Morphological Segmentation?
- a. Does discourse analysis
  - b. Separate words into individual morphemes and identify its class
  - c. Is an extension of propositional logic
  - d. None of the above
- H. Which algorithm takes two sentences and returns a unifier?
- a. Inference
  - b. Depth first search
  - c. Unify algorithm
  - d. Hill climbing search
- I. How do you represent “All dogs have tails”
- a.  $\forall x: \text{dog}(x) \rightarrow \text{hastail}(x)$
  - b.  $\forall x: \text{dog}(x) \rightarrow \text{hastail}(y)$
  - c.  $\forall x: \text{dog}(y) \rightarrow \text{hastail}(x)$
  - d. None of the above
- J. Natural language processing can be divided into the two subfields of
- a. Context and expectations
  - b. Generation and understanding
  - c. Semantics of pragmatics
  - d. Recognition and synthesis
  - e. None of the above

**Fill in the blanks :**

- K. The process of deriving new sentence from knowledge base is called .....
- L. A function that maps from problem state descriptions to measures of desirability is called ..... function.
- M. The full form of IR in language processing is .....
- N. .... of propositional logic is used to compute the truth of a sentence.
- O. There are ..... number of functions available in unification and lifting process.

**True/ False :**

- P. Representational Verification is a property of representation of knowledge.
- Q. The goal of AI is to build systems that exhibit intelligent behaviour.
- R. Only search and not plan is used to achieve agent's goal.
- S. NLP is concerned with the interactions between computers and human (natural) languages.
- T. A problem in a search space is defined by an intermediate state.

**SECTION-B**

- 2. Define a sample problem as a state space search and state its objectives.
- 3. Which algorithms are favoured for search problems and require identification of a global optimal solution?
- 4. What is the primary goal of a Turing test?
- 5. How does contradiction and resolution helps achieving inference in backward reasoning?
- 6. List the advantages of knowledge represented as logic.
- 7. Suppose you are given old assertions and now you have to derive new assertions from the same. Which inference mechanism would be appropriate? Why?

8. Which are the basic requirements that an AI program should fulfil? Explain any two along with an example.
9. Write the answer for following and justify also :
  - a. Which component determines rules an AI program?
  - b. Which component derives new knowledge using inference rules in AI program?

### SECTION-C

10. Discuss the classification of AI techniques and briefly explain the level of model as well criteria for success of Artificial Intelligent based systems.
11. Explain the components of a production system, its characteristics and various issues in the design of search problems.
12. Take an appropriate example and discuss in detail the concept of knowledge representation using predicate logic. How far is resolution important here?
13. For the given relationship expressed in clausal form: object (E, Assignment), action (E, Submit), actor (E, Student), recipient (E, Teacher), is a (Student, Human), is a (Teacher, Human).
  - a. Draw a semantic network.
  - b. In the above clausal form add location (E, Classroom) is added, draw the revised semantic network.
14. Write short notes on following :
  - a. Semantic nets for weak slot and filler structure
  - b. Discourse and pragmatic processing

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**