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3 (Sem-6/CBCS) CSC HC 1

2023

COMPUTER SCIENCE

(Honours Core)

Paper : CSC-HC-6016

(Artificial Intelligence)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions as directed : 1×7=7

(a) What is the total number of quantification available in Artificial Intelligence ?

(i) 3

(ii) 2

(iii) 4

(iv) 1

(Choose the correct option)

Contd.

- (b) Artificial Intelligent systems can act rationally. (State True or False)
- (c) Goal based agents have higher capability than model-based reflex agents. (State True or False)
- (d) _____ is a heuristic search algorithm. (Fill in the blank)
- (e) Hill climbing technique is useful in vehicle routing. (State True or False)
- (f) In first order logic $\exists x\exists y$ is not same as $\exists y\exists x$. (State True or False)
- (g) What is the problem space of means-end analysis ?
- An initial state and one or more goal state
 - One or more initial state and one goal state
 - One initial state and one goal state
 - None of the above
- (Choose the correct option)

2. Define the following terms : 2×4=8

- Intelligent agent
- Simple reflex agent

- Local maxima
- Constraint satisfaction problem

3. Answer **any three** of the following questions : 5×3=15

- What is Turing test ? What is total turing test ?
- What is intelligent agent ? Briefly explain the structure of intelligent agents.
- What are the advantages and disadvantages of depth-first search ?
- Assume the following facts :
 - Ajay likes all kind of food
 - Apple and vegetable are food
 - Anything anyone eats and not killed is food
 - Bimal eats peanuts and still alive
 - Gautam eats everything that Bimal eats.

Prove by resolution that Ajay likes peanuts.

- Write the algorithm for Means-Ends analysis.

4. Answer **any three** questions : $10 \times 3 = 30$

(a) Explain **any two** main categories of intelligent agents. How intelligent agents work ?

(b) What are the features of production system in AI ? What are the disadvantages of production system ?

(c) Explain Hill climbing search algorithm.

(d) What is the problem with minimax search algorithm ? How Alpha-Beta pruning is used to solve the problem ? Explain with suitable example.

(e) Write a prolog program to implement sumlist (list, sum) so that sum is the sum of a given list of numbers list.

(f) Write short notes on : **(any two)**
 $5 \times 2 = 10$

(i) Default reasoning

(ii) Bayesian probabilistic inference

(iii) Transformational grammar

(iv) Augmented transition nets