Code : 051717

B.Tech 7th Semester Special Exam., 2020

ARTIFICIAL INTELLIGENCE

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Answer any *seven* of the following : 2×7=14

(a) What are the goals of artificial intelligence (AI)?

(b) What is Turing test?

(c) Define uniformed search.

(d) Write a short note on MYCIN.

(e) List various schemes of knowledge representation.

(f) What do you mean by agent program?

(g) Define Skolear constant.

(h) What are the types of neural networks?

(i) Write a short note on horizon effect.

(j) What are the factors that a rational agent should depend on at any given time?

2. (a) Prove that breadth-first search and depth-first search are the special cases of best-first search. 7

(b) Explain the AO* algorithm with a suitable example. State the limitations in the algorithm. 7

3. (a) Explain alpha-beta cutoffs during minimax search. 7

(b) Show that the following sentences are inconsistent using propositional logic : 7

(i) If Jack misses many classes through illness, then he fails high school.

(ii) If Jack fails high school, then he is uneducated.

(iii) If Jack reads a lot of books, then he is not uneducated.

(iv) Jack misses many classes through illness and reads a lot of books.

4. (a) Solve the following crypt-arithmetic problem : 7

SEND
+MORE
MONEY

(b) What is sentence level processing? Explain with example. 7

5. (a) Define Hidden Markov Model (HMM). Illustrate how HMMs are used for speech recognition. 7

(b) Prove that the following sentence is valid :

"If prices fall, then sell increases. If sell increases, then John makes the whole money. But John doesn't make the whole money. Therefore, prices do not fall." 7

6. (a) Explain Bayesian network by taking an example. How is the Bayesian network powerful representation for uncertainty knowledge? 7

(b) Write a function in LISP that computes prime number between 1 and 25 (inclusive). 7

7. (a) Differentiate between forward and backward chaining of inference with the help of an example. 7

(b) Write short notes on *(i)* discrete model/maximum-likelihood parameter learning and *(ii)* continuous model. 7

8. (a) Discuss STRIPS robot problem solving system. 7

(b) What do you mean by structured representation of the knowledge? Discuss different types of structured representations of knowledge. 7

9. (a) Why is Natural Language Processing (NLP) used? Is NLP difficult to learn? Explain. 7

(b) Discuss five application areas of medicine in which artificial intelligence is applied. 7

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