

**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 :  $2 \times 7 = 14$

- (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?

**( 2 )**

- (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  
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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." https://www.akubihar.com 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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