(b) For which applications, DENDRAL expert system was devised ? Describe the inference engine of the DENDRAL expert system.    (CO4)

(c) Describe any *four* tools used to develop an expert system.    (CO4)

5. (a) Define the term Pattern Recognition. Describe any *four* recent applications of Pattern Recognition.    (CO5)

(b) With suitable examples, explain the complexities involved in design of a speech recognition system.    (CO5)

(c) Explain some of the features of LISP and PROLOG used to develop Artificial Intelligence applications.    (CO5)

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# TCS-701

## B. TECH. (CSE)
## (SEVENTH SEMESTER)
## END SEMESTER EXAMINATION, 2021-22
## ARTIFICIAL INTELLIGENCE

**Time : Three Hours**    **Maximum Marks : 100**

**Note :** (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

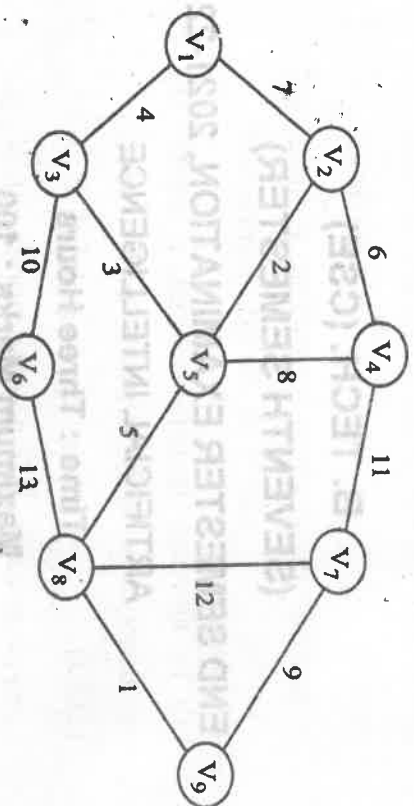(iii) Total marks in each main question are **twenty**.

(iv) Each question carries 10 marks.

1. (a) Discuss application areas of Artificial Intelligence. Also discuss some of the recent industrial applications.    (CO1)

(b) Differentiate between BFS and DFS. Apply both of the algorithms in the following graph : (CO1)



(c) Write and explain the A* algorithm. What are the uses of heuristic search ? (CO1)

2. (a) What is Natural Language Processing ? Explain the concepts of Natural Language Understanding and Natural Language Generation. (CO2)

(b) "Natural Language Processing is a hard task due to presence of ambiguity." Justify the statement. (CO2)

(c) What are the various phases of Natural Language Processing ? Explain context free and transformational grammars in detail. (CO2)

3. (a) What are various techniques used for knowledge representation ? Also discuss advantages and limitations of each of the techniques. (CO3)

(b) Convert the following sentences into predicate logic : (CO3)

• Marcus was a man.

• Marcus was a Pompeian.

• All Pompeians were Romans.

• Caesar was a ruler.

• All Pompeians were either loyal to Caesar or hated him.

(c) Write the Resolution Algorithm used for unification purpose. Give an example. (CO3)

4. (a) What is an expert system ? Describe various components of an expert system. (CO4)