

Bansilal Ramnath Agarwal Charitable Trust's  
**VISHWAKARMA INSTITUTE OF TECHNOLOGY, PUNE – 411037.**  
(An Autonomous Institute Affiliated to Savitribai Phule Pune University)  
**Examination: ESE**

4

Year:TY

Branch: Computer Engg

Subject: Artificial Intelligence

Subject Code: CS3013

Max. Marks: 100

Total Pages of Question Paper: 2

Day & Date: Thu 02/05/2019

Time: 10:00 – 13:00

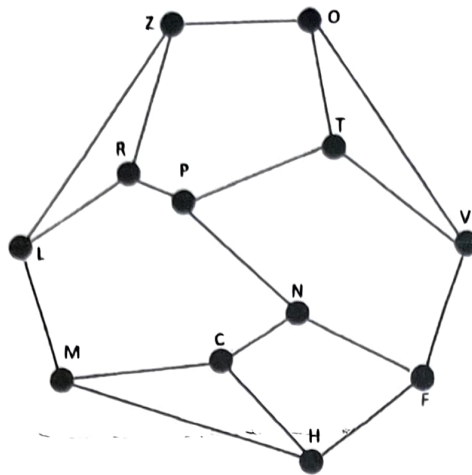
**Instructions to Candidate**

1. All questions are compulsory.
2. Neat diagrams must be drawn wherever necessary.
3. Figures to the right indicate full marks.
4. Use of nonprogrammable electronic pocket calculator, mollier charts, steam tables and statistical table are allowed.

Marks

|     |     |  |          |
|-----|-----|--|----------|
| Q.1 | a   | Apply CSP and if E=4 then identify value of D.<br><br>J E<br>× B B<br>-----<br>J E<br>+ J E A<br>-----<br>B A D E                | 8<br>CO3 |
|     | b   | Demonstrate AO* algorithm on the following graph. Show the marker of further search and identify the value at root node.<br><br> | 8<br>CO3 |
| Q.2 |     | Solve Any 3  |          |
|     | i   | Elaborate "Problem Solving Agents" and its properties.   | 6<br>CO1 |
|     | ii  | Illustrate Conditional planning with respect to suitable examples.   | 6<br>CO5 |
|     | iii | Design heuristic functions to solve 8 Puzzle Problem.  | 6<br>CO3 |
|     | iv  | List the order of inspection till deep blind search and shallow blind search   | 6        |

algorithms terminate on following graph. Start search from P.



**Q.3**

Only 2

i

Design Rules for knowledge based agent for Wumpus World using propositional logic in which agent finds and kills Wumpus.

ii

The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. Prove that Col. West is a criminal using Resolution.

iii

Summarize justification base truth maintenance system with suitable example.

**Q.4**

i

Design Prolog system for designing family tree. Derive rules to check relation of uncle( , \_ ), grandfather( , \_ ). Use fact father( , \_ ).

ii

Differentiate between Belief Network and Hidden Markov network.

**Q.5**

Solve Any Two

i

Differentiate between forward reasoning and Backward reasoning with suitable example.

ii

Draw architecture of expert system and Discuss MYCIN medical diagnosis expert system.

iii

Elaborate significance of Non-Monotonic reasoning in AI with an example.

**Q.6**

a

Design a spam filter application using Naïve Bays technique.

b

Design an expert system for choosing gemstone. Use prolog representation.

c

Convert following statements to CNF

1. Everything attracts everything.
2. Something attracts something.
3. Everything attracts something.
4. Nothing attracts everything.
5. Nothing attracts anything.
6. Something attracts nothing.