B.E. (Information Technology) Seventh Semester (C.B.S.)
Artificial Intelligence

P. Pages : 2

TKN/KS/16/7586

Time : Three Hours

0961

Max. Marks : 80

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Notes : 1. All questions carry marks as indicated.
2. Solve Questions 1 OR Questions No. 2.
3. Solve Questions 3 OR Questions No. 4.
4. Solve Questions 5 OR Questions No. 6.
5. Solve Questions 7 OR Questions No. 8.
6. Solve Questions 9 OR Questions No. 10.
7. Solve Questions 11 OR Questions No. 12.
8. Due credit will be given to neatness.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is Turing Test? Explain the purpose of turing test. **5**

b) Explain the problem characteristics for solving following AI-problems :- **8**
   i) Water – jug problem. ii) Chess Playing.
   iii) 8-puzzle problem.

OR

2. a) Explain the working of production system. Differentiate between monotonic and non-monotonic production system. Give one example of monotonic and non-monotonic production system. **7**

b) Explain the state-space representation used for water jug problem. **6**

3. a) Write the significance of A* algorithm used in solving AI problems. Write the steps used by A* algorithm. **6**

b) Explain constraint satisfaction problem with respect to the cryptarithmetic problem given below : - **7**

   SEND
   + MORE
   ―――――
   MONEY

OR

4. a) Write algorithm mean-ends Analysis MEAN (CURRENT, GOAL) for robot navigation for same, mention the robot operators and difference table. **7**

b) Explain Hill Climbing Algorithm in detail. What are the hurdles in it. What are its advantages? **6**

5. a) List the various approaches to knowledge representation in AI. Discuss the issues related to it. **6**

b) What do you mean by ontology? Explain the ontology concept with reference to diagnosis of any human disease. **7**

OR

6. a) What do you mean by CNF? Explain the process to convert the following proposition into CNF: - **7**
   $D \Leftrightarrow Y \vee \neg (R \vee Z)$

	b)	Give resolution principle, also write resolution algorithm in predicate logic.	**6**

7. a) What is semantic network? Draw the components involved in it. for the sentence given below, construct an semantic network: - **7**
"Every thief was bitten by a police".

    b) Write a script to represent the scenario created for following: - **7**
"Online shopping of book from www.amazon.com."

<div align="center">**OR**</div>

8. a) Writer short note on **any two**. **6**
      i)   Truth Maintenance system and its types.
      ii) Transition Networks – RTN and ATN.
      iii) Techniques of NLP.

    b) Construct a parse tree for the sentence given below. **8**
"Gita saw a dog in the market".
Use the following rules or add some rules is required.

$S \rightarrow NP\ V\ P$ $N \rightarrow Gita\ /\ dog\ |\ market$
$NP \rightarrow N$ $V \rightarrow saw/\ run$
$VP \rightarrow V\ NP$ $PREP \rightarrow in\ /with.$
$NP \rightarrow DET\ N\ PP$
$PP \rightarrow PREP\ NP$
$NP \rightarrow DET\ N$
$DET \rightarrow a\ |\ am\ |\ the$

9. a) What do you mean by expert system? Draw the architecture of expert system and explain the purpose of each component involved in it. **8**

    b) Explain the following :- **6**
      i)   Knowledge engineering process.   ii)   Expert system shell.

<div align="center">**OR**</div>

10. a) Explain in detail about the development phases of expert system life cycle. **6**

    b) Differentiate the following pairs **8**
      i)   Data base versus knowledge base.
      ii) Conventional system versus Expert system.

11. a) State and explain bayes theorem. Also, write the Significance of bayes theorem. **6**

    b) Explain the Dumpster- Shafer theory with suitable example. **7**

<div align="center">**OR**</div>

12. a) Explain the Bayesian network with suitable example. **6**

    b) What do you mean by certainty factor? How we can find the CF for proving certainty of any hypothesis? **4**

    c) How fuzzy set is different from crisp set? **3**

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