

**B.Tech. SEM -VII ( Computer) 2014 Course (CBCS) : WINTER - 2018**  
**SUBJECT- ELECTIVE III: ARTIFICIAL INTELLIGENCE & ROBOTICS**

Day: Monday  
Date: 03/12/2018

W-2018-2542

Time: 02.30 PM TO 05.30 PM  
Max Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

- Q.1** What is state space search? Before we can solve a problem using state space search, we must define an appropriate state Space. For each of the following problems, find a State Space representation. (10)
- i) Tic-tac-toe
  - ii) Water jug problem
- OR**
- How to evaluate the performance of an algorithm? How does uniform cost search use algorithm's performance? (10)
- Q.2** How can knowledge expressed in predicate logic. Convert the following statements to clause form. (10)
- a. Every child likes candy.
  - b. Anyone who likes candy is not a nutrition fanatic.
  - c. Anyone who eats any Pumpkin is nutrition fanatic.
  - d. Anyone who buys any Pumpkin either carves it or eats it.
  - e. John buys Pumpkin.
- OR**
- Explain how Conceptual Dependency (CD) can be used to represent knowledge. Use it to represent the following statements. (10)
- i) John is a good Programmer
  - ii) Joe gave John a book.
- Q.3** Explain how Planning problem is expressed in STRIPS. (10)
- OR**
- List and explain all the Components of Planning System. (10)
- Q.4** Explain Supervised Learning and Unsupervised Learning? Give example of each. (10)
- OR**
- Discuss the application of decision tree for a "Restaurant". (10)
- Q.5** Discuss various position sensors used in Robots. (10)
- OR**
- Define Robotics and explain various types of Joints used in Robot with neat sketches. (10)
- Q.6** Describe the Lagrangian mechanics for finding dynamic equations of a Robot. (10)
- OR**
- Derive Forward & Inverse Kinematics equations of manipulator for a particular position. (10)

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