

SEAT No. :

[Total No. of Pages : 2

[5461]-592

B.E. (Computer Engineering)

**ARTIFICIAL INTELLIGENCE AND ROBOTICS
(2015 Pattern) (Semester - I) (410242) (End Sem.)**

2 1/2 Hours]

Options to the candidates:

Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, and Q9 or Q10.

Neat diagrams must be drawn wherever necessary.

Figures to the right side indicate full marks.

Assume suitable data if necessary.

Justify your answer with an example wherever necessary.

[Max. Marks : 70

Explain iterative deepening depth first search (DFID) and justify its parameters based on time complexity, space complexity. [6]

Differentiate between uninformed and informed search methods. [6]

OR

Apply crypt-arithmetic to solve the problem and represent the state search space to solve. TWO + TWO = FOUR. [6]

Explain Hill climbing algorithm. Explain Local maxima, Global Maxima and Plateau for an example. [6]

Represent the following sentences into formulas in predicate logic, [6]

- i) John likes all kinds of food.
- ii) Apples are food.
- iii) Chicken are food.
- iv) Anything anyone eats and isn't killed by is food.
- v) Bill eats peanuts and is still alive.
- vi) Sue eats everything Bill eats.

Explain the components of a planning system for a simple Blocks World example. [6]

OR

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- Q4) a) Explain forward chaining and backward chaining for a simple example. [6]
- b) Explain different Facets of Knowledge with examples. [6]

- Q5) a) Explain in detail all the phases of Natural Language Processing (NLP). [6]
- b) Explain supervised and unsupervised learning with an example. [6]
- c) Write a short note on Radar. [6]

OR

- Q6) a) Explain the Bug2 algorithm for path planning for a point robot. [6]
- b) Explain the architecture of Artificial Neural Network. [6]
- c) Explain simultaneous localization and mapping (SLAM) for a point robot. [6]

- Q7) a) Explain the architecture of information retrieval system. [6]
- b) Compare the various weighting functions used in pose estimation. [4]
- c) Explain the inertial sensors - accelerometers and gyroscopes. [4]

OR

- Q8) a) Comment on the fundamental problems in Robotics. [6]
- b) Explain the applications of Natural Language Processing. [4]
- c) Comment on how robotics can be used to design intelligent vehicles. [4]

- Q9) a) Comment on the importance of mapping and the layers of map data. [6]
- b) Explain horizontal decomposition used in the design of many autonomous robot systems. [4]
- c) With the help of an architecture diagram explain multilayer feed forward artificial neural network. [4]

OR

- Q10) a) Comment on any two robots used in practice. [6]
- b) Comment on problem regarding natural language processing (NLP) in information retrieval (IR). [4]
- c) Explain in brief infrared sensors. [4]

[5461]-592