CS8691 ARTIFICIAL INTELLIGENCE

IMPORTANT QUESTIONS AND QUESTION BANK

UNIT I – INTRODUCTION

2-Marks

1. Define Artificial Intelligence?
2. Differentiate Natural Intelligence from Artificial Intelligence?
3. What are the capabilities computers needs to pass total Turing test?
4. Why are condition-action rules important in the design of an agent?
5. Infer the structure of an agent in an environment?
6. State and Express the concept of rationality?
7. Generalize and define Omniscience and information Gathering?
8. What is important for task environment?
9. List the properties of environments?
10. Express the ways to formulate a problem?

Part-B

1. Summarize in detail about production system characteristics?
2. Can you apply the facts to describe Iterative deepening depth first search?
3. Compare and contrast human intelligence to artificial intelligence with numerous examples and applications?
4. Discuss about agents and Environments?
5. Analyse the Characteristic of intelligent Agents?
6. Compose and explain in detail about intelligent agents?
7. Examine the PEAS specification of the task environment of an agent?
8. Explain the structure of agents?
9. Discuss about the multi – agent systems with the help of illustration?
10. Describe the role of communication for intelligent agents?
11. Show how problem solving agents solving contingency problems different from the one solving exploratory problems?
12. Consider the given problem. Describe the operator involved in it. Consider the water jug problem: You are given two jugs, a 4-gallon one and 3-gallon Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallon of water from the 4-gallon jug Explicit Assumptions: A jug can be filled from the pump, water can be poured out of a jug on to the ground, water can be poured from one jug to another and that there are no other measuring devices available (May/June 2016) `(Nov/Dec-2016)?
13. Compose the process of simulated annealing with example?
14. Develop your own multi – agent systems with the help of an illustration?

15. Describe in detail about
    i) Simple reflex agent
    ii) Model based agent
    iii) Utility based agent
    iv) Goal based agent

UNIT II - PROBLEM SOLVING METHODS

2-Marks

1. Discover what is optimal solution?
2. Rank and list the criteria to measure the performance of search strategies?
3. Show the significance of using heuristic functions?
4. Generalize and define the effect of heuristic accuracy on performance?
5. Differentiate uninformed search and informed search?
6. Examine the breadth first search?
7. Summarize Simulated annealing?
8. Analyse the definition of greedy best-first search?
9. Tell the classification of CSP with respect to constraints?
10. Pointout and define node consistency, arc consistency and path consistency?

Part -B

1. Relate first order logic with proposition logic and discuss in details about the same?
2. Compose what is uninformed search? Explain depth first search with example?
3. Compose the algorithm for recursive best first search?
4. Explain the nature of heuristics with an example. What is the effect of heuristic accuracy on performance?
5. Write a simple back tracking algorithm for constraint satisfaction problems?
6. What are the problems caused due to incomplete knowledge on the states or actions? Define each with example?
7. Explain constraint satisfaction problem in detail?
8. What are the five uninformed search strategies? Explain any two in detail with example?
9. Describe the approach of formulation for constraint satisfaction problems with example?
10. Explain the components of problem definition with example? Briefly explain the search strategies in uninformed search?
11. Explain Briefly Problem Solving Strategies?
12. Describe Alpha Beta Pruning with Algorithm?
13. Compose the process of simulated annealing with example?
14. Develop the algorithm for steepest ascent hill climbing?

15. Show and explain Optimization Problems?

UNIT-III KNOWLEDGE REPRESENTATION

2-Marks

1. Define Universal Instantiation?
2. Define Existential Instantiation?
3. What is first-order logic?
4. Represent the following sentence in predicate form "All the children like sweets?
5. Define universal and existential quantifiers?
6. What is Prolog?
7. What are the elements and symbols of First order logic?
8. What are the three families of First-order inference algorithms?
9. What are the four parts of knowledge in first-order logic?
10. State the use of unification. (OR) What is the significance in using the unification algorithm?

Part-B

1. Explain the inference process in first order logic, using suitable example Prolog Programming?
2. What are the steps to convert first order logic sentence to Normal form? Explain each step?
3. Explain the forward chaining process and efficient forward chaining in detail with example. What is the need of incremental forward chaining?
4. Describe the steps involved in the knowledge engineering process with example. Give the five logical connectives used to construct complex sentences and give the formal grammar of propositional logic?
5. Consider the following facts and represent them in predicate form: F1. There are 500 employees in ABC company.
   F2. Employees earning more than Rs. 5000 pay tax.
   F3. John is a manager in ABC company.
   F4. Manager earns Rs. 10,000.
   Convert the facts in predicate form to clauses and then prove by resolution: "John pays tax"?
6. Explain Ontological Engineering Categories and Objects – Events - Mental Events and Mental Objects?
7. Write a short note on Reasoning Systems for Categories?
8. Explain briefly Reasoning with Default Information?
9. Explain with an example the use of unification algorithm to prove the concept of resolution?

10. Develop and explain about the mental events and mental objects with example?
11. Summarize about the reasoning systems for categories with examples?
12. Explain resolution in predicate logic with suitable example?
13. How would you identify an example for resolution?
14. Illustrate the user of First Order Logic to represent Knowledge?
15. Consider the following sentences:
    - John like all kinds of food
    - Apples are food
    - Chicken is food
    - Anything anyone eats and isn't killed is food • Bill eats peanuts and still alive
    - Sue eats everything Bill eats

    (i)Translate these sentences into formulae in predicate logic. (ii)Convert the above FOL into clause form?

UNIT IV - SOFTWARE AGENTS

2-Marks

1. Define Purely Reactive Agents?
2. What are the two types of information source?
3. What are characteristics of the subsumption architecture?
4. State the advantage of vertically layered architecture?
5. Explore some interesting properties of agents and perception?
6. What are four classes of agents?
7. What are logical formulae and logical deduction?
8. Define belief-desire-intention (BDI) architectures?
9. State the advantage of horizontal layered architectures?
10. Give the Diagrammatic Representation of Trust and Reputation Models for Multiagent Systems?

Part-B

1. What are Abstract Architectures for Intelligent Agents?
2. Write briefly on Concrete Architectures for Intelligent Agents?
3. Write a short note on Layered architectures?
4. Define Agent Communication. Write a short note on coordination, Dimensions of meaning and Message types?
5. Explain Negotiation in detail?
6. Explain Bargaining theories in detail?
7. Narrate Argumentation among Agents in detail?
8. With diagrammatic representation, explain Trust and Reputation in Multi-agent systems in detail?
9. Compare and contrast about the negotiation and bargaining?
10. Describe the trust and reputation in multi-agent systems?
11. How do you execute the planning in solving problems?

12. Create and design the architecture of intelligence agent with an example?
13. Explain about the agent communication?
14. Analyse about the planning and acting in the real world is happens and explain it/
15. Develop the trust and reputation in multi-agent systems and make fective analysis over it?

UNIT V – APPLICATIONS

2-Marks

1. List various applications of Artificial Intelligence?
2. Define Language Modeling?
3. What is Natural language processing (NLP)?
4. What is Information retrieval?
5. How is Information Retrieval System characterized?
6. What are the objective of NLP?
7. What are the features of NLP?
8. What is meant by Machine Translation?
9. Mention basic hardware component of a Robot?
10. Define Planning in Artificial Intelligence?

Part-B

1. Explain the various applications of Artificial Intelligence in detail?
2. What is Language model? Explain in detail?
3. Discuss the concept of Information retrieval?
4. What are the ways Information Retrieval can be characterized?
5. How is Knowledge Acquired by the process of Information Extraction?
6. Explain N-gram character models Smoothing n-gram models?
7. Write notes on Model evaluation N-gram word models?
8. Explain how to translate text from one natural language (the source) to another (the target) with example?
9. Explain the concept of machine translation in detail?
10. Explain Speech Recognition concept in detail?
11. Write about information retrieval and information exchange?
12. Prepare how the natural language is processing, explain with a relevant example?
13. Explain about the machine translation is made and give the best example for that with explanation?
14. Analyse about the speech recognition application and explain about its functionalities?
15. Design a robotic action with the appropriate hardware needed and give the explanation?