**Sample Questions**

Computer Engineering

**Subject Name:** Artificial Intelligence (CSC604) **Semester: VI**

Multiple Choice Questions

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|  | **Choose the correct option for following questions. All the Questions carry equal marks**  |
| 1. | What is the goal of Artificial Intelligence? |
| Option A: | To solve artificial problems |
| Option B: | To extract scientific causes |
| Option C: | To explain various sorts of intelligence |
| Option D: | To solve real-world problems |
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| 2. | Which of the following is a component of Artificial Intelligence? |
| Option A: | Learning |
| Option B: | Designing |
| Option C: | Puzzling |
| Option D: | Training |
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| 3. | What is the function of an Artificial Intelligence “Agent”? |
| Option A: | Mapping of precept sequence to an action |
| Option B: | Work without the direct interference of the people |
| Option C: | Mapping of environment sequence to an action |
| Option D: | Mapping of goal sequence to an action |
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| 4. | What is the action of task environment in artificial intelligence? |
| Option A: | Problem |
| Option B: | Solution |
| Option C: | Agent |
| Option D: | Observation |
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| 5. | Which of the following is not the commonly used programming language for Artificial Intelligence? |
| Option A: | Perl |
| Option B: | Java |
| Option C: | PROLOG |
| Option D: | LISP |
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| 6. | Which of the following machine requires input from the humans but can interpret the outputs themselves? |
| Option A: | Actuators |
| Option B: | Sensor |
| Option C: | Agents |
| Option D: | AI system |
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| 7. | Which search comes under Local search ? |
| Option A: | A\* search |
| Option B: | BFS |
| Option C: | Hill Climbing Search |
| Option D: | DFS |
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| 8. | Memory space requirement in hill climbing algorithm is \_\_\_\_\_ |
| Option A: | Less |
| Option B: | More |
| Option C: | very high |
| Option D: | Zero |
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| 9. | Which search strategy is also called as blind search? |
| Option A: | Simple reflex search |
| Option B: | Uninformed search |
| Option C: | Informed search |
| Option D: | Adversarial search |
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| 10. | The time and space complexity of BFS is (For time and space complexity problems consider b as branching factor and d as depth of the search tree.) |
| Option A: | O(bd+1) and O(bd+1) |
| Option B: | O(b2) and O(d2) |
| Option C: | O(d2) and O(b2) |
| Option D: | O(d2) and O(d2) |
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| **11.** | What are the two main features of Genetic Algorithm? |
| Option A: | Crossover techniques & Random mutation |
| Option B: |  Fitness function & Crossover techniques |
| Option C: | Individuals among the population & Random mutation |
| Option D: | Random mutation & Fitness function |
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| **12.** | What is state space? |
| Option A: | The whole problem |
| Option B: | Your Definition to a problem |
| Option C: | Problem you design |
| Option D: | Representing your problem with variable and parameter |
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| **13.** | \_\_\_\_\_\_ are the curves in the search space that leads to sequence of local maxima |
| Option A: | Plateau |
| Option B: | Ridges |
| Option C: | Peak |
| Option D: | Mount |
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| **14.** | Which is a best way to go for Game playing problem |
| Option A: | Linear approach |
| Option B: | Heuristic approach |
| Option C: | Random approach |
| Option D: | Optimal Approach |
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| **15.** | Where does the values of alpha-beta search get updated? |
| Option A: | Along the path of search |
| Option B: | Initial state itself |
| Option C: | At the end |
| Option D: | None of the mentioned |
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| **16.** | Which function is used to calculate the feasibility of whole game tree? |
| Option A: | Evaluation function |
| Option B: | Transposition |
| Option C: | Alpha-beta pruning |
| Option D: | All of the mentioned |
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| **17.** | In propositional logic, propositional symbols are denoted with \_\_\_\_\_\_\_\_\_. |
| Option A: | capital letters |
| Option B: | numbers |
| Option C: | double letters |
| Option D: | double digits |
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| **18.** | FOL is a |
| Option A: | lower level logic |
| Option B: | foundation level logic |
| Option C: | post order logic |
| Option D: | higher level logic |
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| **19.** | Which are more suitable normal form to be used with definite clause? |
| Option A: | Positive literal |
| Option B: | Negative literal |
| Option C: | Generalized modus ponens |
| Option D: | Neutral literal |
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| **20.** | Which is mainly used for automated reasoning? |
| Option A: | Backward chaining |
| Option B: | Forward chaining |
| Option C: | Logic programming |
| Option D: | Parallel programming |
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| **21.** | Antecedent to consequent is the flow of \_\_\_\_\_\_\_\_\_\_ |
| Option A: | Backward Chaining |
| Option B: | Forward Chaining |
| Option C: | First Chaining |
| Option D: | Last Chaining |
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| **22.** | Which of the mentioned point correctly defines a quantifier in AI? |
| Option A: | Quantifiers are numbers ranging from 0-9. |
| Option B: | Quantifiers are the quantity defining terms which are used with the predicates. |
| Option C: | Quantifiers quantize the term between 0 and 1. |
| Option D: | Quantifiers quantize the term between 10 and 100. |
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| **23.** | Knowledge and reasoning also play a crucial role in dealing with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ environment. |
| Option A: | Completely Observable |
| Option B: | Partially Observable |
| Option C: | Neither Completely nor Partially Observable |
| Option D: | Only Completely and Partially Observable |
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|  **24.** | Which of the following is not the style of inference? |
| Option A: | Forward Chaining |
| Option B: | Backward Chaining |
| Option C: | Resolution Refutation |
| Option D: | Modus Ponen |
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|  **25.** | What is the form of Fuzzy logic? |
| Option A: | Two-valued logic |
| Option B: | Crisp set logic |
| Option C: | Many-valued logic |
| Option D: | Binary set logic |
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|  **26.** | Which of the following is an advantage of using an expert system development tool? |
| Option A: | imposed structure |
| Option B: | knowledge engineering assistance |
| Option C: | rapid prototyping |
| Option D: | all of the mentioned |
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|  **27.** | What is Decision Tree? |
| Option A: | Flow-Chart |
| Option B: | Structure in which internal node represents test on an attribute, each branch represents outcome of test and each leaf node represents class label |
| Option C: | Flow-Chart & Structure in which internal node represents test on an attribute, each branch represents outcome of test and each leaf node represents class label |
| Option D: | None of the mentioned |
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|  **28.** |  Which values are independant in minimax search algorithm? |
| Option A: | Pruned leaves x and y |
| Option B: | Every states are dependant |
| Option C: | Root is independant |
| Option D: | None of the mentioned |
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|  **29.** | Which of the following includes major tasks of NLP? |
| Option A: | Automatic Summarization |
| Option B: | Discourse Analysis |
| Option C: | Machine Translation |
| Option D: | All of the mentioned |
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| **30.** | What is the main challenge/s of NLP? |
| Option A: | Handling Ambiguity of Sentences |
| Option B: | Handling Tokenization |
| Option C: | Handling POS-Tagging |
| Option D: | All of the mentioned |

Descriptive Questions

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| **10 marks each** |
| Explain steps in problem formulation with example. |
| Draw and Describe the Architecture of Utility based agent. How is it different from Model based agent? |
| Compare different uninformed search strategies. |
| Explain DFS algorithm with example. |
| Define the terms chromosome, fitness function, crossover and mutation as used in Genetic algorithms. Explain how Genetic algorithms work. |
| Explain BFS algorithm with example. |
| Explain the steps involved in converting the propositional logic statement into CNF with suitable example. |
| Consider the search problem below with start state S and goal state E. The transaction cost and heuristic values are given. What is the final cost using A\* algorithm to reach from the start State to goal state? (Heuristic values S=10, A=5, B=6, Y=8, Z=5, C=4, D=15, E=0 |
| Figure depicts a search space in which the nodes are labelled with names like A,B, C and D. Node S is the start node and G is the goal node1. List the order in which the Depth First Search algorithm inspect the nodes in Figure whenever there is a contention between more than one node the algorithm chooses one on left
2. What is the path found by the algorithm in the previous question?
3. List the order in which the Bredth First Search algorithm inspect the nodes in figure
4. What is the path found by the algorithm in previous question?

List the order in which DFID algorithm inspect the nodes in figure |
| What are steps involved in natural language processing (NLP) of an English sentence? Explain with an example sentence. |
| Examine Architecture of Expert Systems with its applications |
| Describe backward chaining with example. |
| Design planning agent to solve block world problem. Assume suitable initial state and final state for the problem. |
| Discuss partial order planning giving suitable example. |
| Explain decision tree learning with an example. What are decision rules? How to use it for classifying new sample. |

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| **5 marks each** |
| Define Intelligent Agent. What are the characteristics of Intelligent Agent? |
| What is an agent? Explain basic building blocks of learning agent? |
| Describe different types of environments application to AI System. |
| Formulate 8-puzzle problem |
| Explain detail architecture of goal based agent. |
| Explain heuristic function with example. |
| Explain various method of knowledge representation techniques. |
| Differentiate between forward and backward chaining. |
| Write short note on Hill Climbing algorithms. |
| Draw game tree of tic-tac-toe problemWhat is Min-Max search? |
| Write short note on admissibility of A\*. |
| Give PEAS properties of WUMPUS world. |
| Write first order logic statements for the following1. If a perfect square is divisible by a prime p then it is also divisible by square of p.
2. Every perfect square is divisible by some prime
3. Alice does not like Chemistry and History
4. If it is Saturday and warm, then Sam is in the park

Anything anyone eats and is not killed is a food |
| Convert the following propositional logic statement into CNF “If it is humid then it will rain, since it is humid it will rain” |
| Define Belief Network. Explain conditional Independence relation in Belief Network with example. |
| Short note on predicate logic. |
| What is planning in AI? |
| Define partial order planner. |
| Describe unsupervised learning with example. |
| Write short note on natural language processing |