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| **DIT UNIVERSITY DEHRADUN**   |  |  | | --- | --- | | **B.TECH (CSE/IT)** | **MID TERM EXAM, EVEN SEM 2024-25 (BACK) Sem-V** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Artificial Intelligence** | | | | | | | | | | | | |

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| **Time: 2 Hours** | **Total Marks: 50** |
| **Note: No student is allowed to leave the examination hall before the completion of the exam.**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  | | --- | --- | | **SECTION 1 : Attempt any four questions from the following : [4 x 5= 20]** | | |  | | | **Q.1.1)** | Explain the difference between predicate logic and propositional logic? Explain atomic and compound preposition with example? | | **Q.1.2)** | Explain the difference between List, Tuple, Set, and Dictionary? | | **Q.1.3)** | What is state space representation? What is exploration and exploitation? | | **Q.1.4)** | Develop a Python function that accepts two integer lists entered by the user and returns a new list containing only common elements (without duplicates).  [**Note:** Do not use inbuilt functions.] | | **Q.1.5)** | Explain with example the working of breadth first search (BFS) algorithm. | | **SECTION 2 : Attempt any three questions from the following : [3 x 10= 30]** | | |  | | | **Q.2.1)** | Solve the cryptarithmetic problem for the following: **[5+5]** | | **Q.2.2)** | Apply (i) Greedy BFS, (ii) A\* algorithm for the graph shown in Fig. 1. Then compare the results in terms of a) path found from start to goal node and b) cost of path for each algorithm. [**Note:** The numbers on edges represent path cost and numbers written in round brackets represent the heuristic values. Show stepwise procedure in detail.] **[5+5]**    Fig. 1 | | **Q.2.3)** | (a) Explain the basic concept of min-max algorithm. **[5]** | | (b) Apply the DFS algorithm to the graph shown in Fig. 2 and give the path traversal sequence considering S to be the root node and G to be goal node. **[5]**    Fig.2  [**Note:** Show each step indicating the contents of the used data structure at each step] | | **Q.2.4)** | (a) Explain the various features of an agent environment. **[5]** | | (b) Apply alpha-beta pruning to the game tree shown in Fig. 3 and explain in detail each step of working. **[5]**    Fig. 3 | | **-----END OF PAPER ----** | | | |