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| **DIT UNIVERSITY DEHRADUN**   |  |  | | --- | --- | | **B.TECH (CSE/IT)** | **MID TERM EXAMINATION, ODD SEM 2024-25 (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 A : Attempt any four questions from the following : [4 x 5= 20]** | | | | |  | | **BTL** | **CO** | | **Q.1)** | Explain the different types of AI in detail. | **2** | **1** | | **Q.2)** | Explain with example the terms (i) Variables, (ii) Domain, (iii) Constraints and (iv) Constraint graph in constraint satisfaction problem. | **2** | **1** | | **Q.3)** | Explain the various features of an agent environment. | **2** | **1** | | **Q.4)** | Create a function in Python that accepts two lists entered by the user (containing integer values) and returns the Union and Intersection of the entered lists.  [**Note:** Do not use inbuilt functions.] | **6** | **2** | | **Q.5)** | Explain with example the working of min-max algorithm. | **2** | **1** | | **SECTION B : Attempt any three questions from the following : [3 x 10= 30]** | | | | |  | | **BTL** | **CO** | | **Q.6)** | Solve the cryptarithmetic problem for the following: | **3** | **2** | | **Q.7)** | For the graph shown in Fig. 1, apply (i) Greedy BFS, (ii) A\* algorithm.  Compare the results in terms of path from source to goal node and path cost.  D:\July 2024\AI-BTech-5th sem\Course related\Fig 2.jpg  Fig. 1  [**Note:** The numbers on edges represent path cost and numbers written in round brackets represent the heuristic values. Show stepwise procedure in detail.] | **3,4** | **2,3** | | **Q.8)** | (a) Write the algorithm for implementing depth first search (DFS).  **[4 Marks]** | **1** | **2** | | (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.  D:\July 2024\AI-BTech-5th sem\Course related\Fig 1.jpg  Fig.2  [**Note:** Show each step in detail indicating the contents of the used data structure at each step.]  **[6 marks]** | **2** | **3** | | **Q.9)** | (a) Explain the basic concept of alpha-beta pruning.  **[3 marks]** | **2** | **1** | | (b) Apply alpha-beta pruning to the game tree shown in Fig. 3 and explain in detail each step of working.  D:\July 2024\AI-BTech-5th sem\Course related\Fig 3.jpg  Fig. 3  **[7 marks]** | **3** | **2** | | **-----END OF PAPER ----** | |  |  | | |