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| **Vivekanand Education Society’s Institute of Technology, Chembur, Mumbai,**  **Department Of AI and DS, Year:2023-24 (Odd Sem) Test No.- 1** |
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| **Class : Third Year** | **Division: D11AD** |
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| **Semester :V** | **Subject:Artificial Intelligence** |
| **Date: 6/9/2023** | **Time: 1 hr** |

| **Q.1** |  | **(Attempt any five of the following)** | **Marks**  **(20)** | **COs** |
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|  | a) | What is intelligence? How do you measure it? | 2M | CO1 |
|  | b) | Develop a PEAS for Chandrayaan 3 Pragya rover agent.  *Performance measure: Distance the rover traverses, along the number of collected samples or possibly finding life, or maximize lifetime etc*  *Environment: Mars surface is partially observable, nondeterministic, sequential*  *dynamic and continuous*  *Actuators: wheels, robot arm, drill, radio transmitter*  *Sensors: camera, spectrometers* | 2M | CO3 |
|  | c) | Articulate heuristic function for the PAC-MAN game.  *Consider an intermediate state which may have already visited any of the four corners. List out the unvisited corners and compute the Manhattan distance to each of them. Now select the corner with minimum manhattan distance.Note down the distance. This is the minimum number of steps needed to reach the corner irrespective of board. Update the current position of pacman to this corner. Remove this corner from the unvisited corners list.*  *Loop over until the unvisited corners is empty. The sum of these distances will be an Admissible and Consistent Heuristic.* | 2M | CO2 |
|  | d) | * Consider AI based game PUBG define environment types for the same * *Partially observable* * *Multi agent* * *Stochastic* * *Sequential* * *Dynamic* * *Discrete* | 2M | CO3 |
|  | e) | Select a suitable agent design   1. Writing an intentionally funny story : utility based 2. Giving competent legal advice in a specialized area of low : goal base | 2M | CO2 |
|  | f) | Determine properties of blind search : depth first search | 2M | CO1 |
| **Q.2** | a) | Explain Alpha Beta search and apply into the graph given below. | 5M | CO3 |
|  |  | **OR** |  |  |
|  | b) | Define the initial and goal state of three missionaries and cannibals problem. Describe the set of operators using if-then rules.  Draw the entire state space graph (include only legal states, that is, states in which cannibals do not outnumber missionaries on either side of the river) . State best searching algorithm for it | 5M | CO3 |
| **Q.3** | a) | Give solution in order to overcome local maxima problem of hill climbing algorithm  *Simulated Annealing* | 5M | CO3 |
|  |  | **OR** |  |  |
|  | b) | Apply A\* algorithm for solving 8-puzzle problem | 5M | CO3 |

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