DEPARTMENT : Computer Science and Engineering

DATE & TIME OF EXAM : 7th September 2021, 3.30 pm

SUB CODE & TITLE : CSPC54 – Introduction to AI and ML

SEMESTER & YEAR : V & III (B.Tech CSE)

DURATION : 1 hr

**MARKS : 15 marks**

1. Define PEAS and characterise it in terms of the properties of the environment for the following: (2)
   * Bidding on an item at an auction
   * Knitting a sweater
2. Draw the block diagram of a goal-based / utility-based agent in the context of solving the following problems: (2)
   * Practising Tennis against a wall
   * Writing an examination through online mode
3. Consider the missionaries and cannibals problem. Three missionaries and cannibals are on one side of a river along with the boat that can hold only two people. Find a way to get everyone to the other side of the river without leaving a group of missionaries in one place outnumbered by the cannibals in that place.
   * Formulate the problem and highlight the distinctions for a valid solution. Construct the complete state space tree (2)
   * Solve the problem using BFS and A\* search by using an appropriate heuristic function (2)
   * Compare the performance of BFS and A\* search on the solution with respect to time and space complexity (1)
4. Consider the following board state. Select the next move for MAX using minimax algorithm by putting a X. Draw the remaining statespace tree from this representation and generate values for the node. (4)

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| --- | --- | --- |
|  | O | O |
|  | X |  |
| X |  |  |

1. Apply alpha-beta pruning for the selecting the move in the above question. (2)

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