# **Question Paper**

Exam Date & Time: 06-Feb-2023 (09:30 AM - 12:30 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

## INTERNATIONAL CENTRE FOR APPLIED SCIENCES Make -Up examination - January/ February -2023 III semester B. Sc. (Applied Sciences) in Engg.

## **ARTIFICIAL INTELLIGENCE [ICS 236 - S2]**

Marks: 50

#### Duration: 180 mins.

#### Answer all the questions.

#### Missing data, if any, may be suitably assumed.

- Suppose you design a machine to pass the Turing test. What are the capabilities such a machine must have? Explain.
  - )
  - B) Take an example and explain most simple and most difficult task environment <sup>(5)</sup> in which agent has to operate.
- With a neat block diagram explain model based reflex agents and goal-based <sup>(5)</sup> agents.
  - B)
    - Consider a graph shown in Figure 1, where S is the start node and G is the goal node. Use Breadth-first search and Depth-first search techniques for tree traversal from start node to goal node. Show the contents of open and closed lists at each step. Compare both the techniques using time and space complexity.



<sup>3)</sup> Start state and goal state of 8 puzzle problem is shown in Figure 2. Calculate <sup>(5)</sup> the evaluation function f(n)=g(n)+h(n) at each state. Where g(n) is the depth of node n in search tree and h(n) is the number of tiles not in their goal position in a given state n. Draw the complete search tree. (Child nodes are created in up, left, right and down order).