314333

12526

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

a) List any two properties of an environment in AI.

b) Define heuristic function.

c) Define planning in AI.

d) Define learning in AI.

e) State the meaning of computer vision in robotics ?

f) Define knowledge in the context of AI.

g) Describe the reinforcement learning.

P.T.O.

Marks

2. Attempt any THREE of the following : **12**

a) Differentiate between rational agent and intelligent agent.

b) Explain the properties of a search algorithm: completeness, optimality, time complexity, and space.

c) Illustrate different types of reasoning in AI.

d) Explain the importance of AI in real-world perception and natural language processing for robots.

3. Attempt any THREE of the following : **12**

a) Define initial state, action, plan and path cost w.r.t state space search.

b) Compare BFS and DFS in terms of time and space complexity.

c) Describe the architecture of a knowledge-based agent.

d) Discuss the ethics and risks of AI in robotics with suitable case studies.

4. Attempt any THREE of the following : **12**

a) Illustrate the working of greedy best-first search with a suitable example.

b) Represent a search problem with suitable example.

c) State and explain different types of learning.

d) Discuss the risks associated with AI-enabled robots in society.

e) Describe the role of AI in navigation and motion control of robots.

Marks

5. Attempt any TWO of the following : **12**

a) Evaluate the advantages and limitations of heuristic search compared to uninformed search strategies.

b) Discuss the various types of planning in AI with suitable examples.

c) Explain the stages of predictive modeling with suitable examples.

6. Attempt any TWO of the following : **12**

a) Analyze the evolution of Al from its history to its present applications in robotics.

b) Explain the A* search algorithm in detail and prove why it is both complete and optimal ?

c) Compare supervised, unsupervised, and reinforcement learning with suitable real-world applications.
