

Time: 2 ½ Hours

Marks: 75

N.B.

- 1) All questions are compulsory.
- 2) Figures to the right indicate marks.
- 3) Illustration, I depth answers and diagram will be appreciated.
- 4) Mixing of sub-questions is not allowed.
- 5) Each question carries 5 marks.

**Q.1 Attempt Any Three of the following.**

**15 Marks**

- a) Differentiate Between Active Sensors and Passive Sensors.
- b) Write a short note on Vacuum Grippers
- c) What is Actuator? What are the Types of Actuators?
- d) Explain briefly Neural Network and it important in AI.
- e) What is Robot? What are characteristics of Robot?
- f) Write a short note on Robot Components.

**Q.2 Attempt Any Three of the following.**

**15 Marks**

- a) State and explain different types of Actuators?
- b) Write a short note on Degree of freedom Locomotion.
- c) Define Edge Detection. How is it used in Robotics?
- d) What do you mean by Stereo Vision?
- e) State and Discuss different types of Feedback Control.
- f) Write a short note on Sonar sensing.

**Q.3 Attempt Any Three of the following.**

**15 Marks**

- a) Explain the relationship between Control architectures and Programming Languages.
- b) How does representation make an impact on Robotics Controlling?
- c) What do you mean by Behaviour Arbitration?
- d) Explain the concept of Path Planning.
- e) Define Reactive System with example.
- f) Write a short note on behaviour based control.

**Q4. Attempt Any Three of the following.**

**15 Marks**

- a) Differentiate between DFS and BFS.
- b) Explain heuristic function with example.
- c) Explain hill climbing algorithm.
- d) Explain local beam search.
- e) Explain Dijkstra's algorithm with example.
- f) Explain A\* algorithm. What is admissibility in A\* algorithm.

**Q5. Attempt Any Three of the following.**

**15 Marks**

- a) What is connection between "cybernetics" and "cyberspace?"
- b) What is application of Vision System?
- c) Explain Biological Vision with example.
- d) Define the term Planning. What are the important factors affecting planning?
- e) Explain state space search.
- f) Explain branch and bound algorithm with example.

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