

[Time:2.30 Hrs]

[ Marks:60 ]

Please check whether you have got the right question paper.

N.B: (1) All questions are compulsory.

(2) Figures to the right indicate full marks.

(3) Assume additional data if necessary but state the same clearly.

(4) Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.

- Q.1 Attempt any two of the following 12**
- Differentiate between open-loop and closed-loop control systems.
  - Discuss the challenges associated with robotic manipulation.
  - Differentiate between DC and AC motors.
  - Discuss the components involved in teleoperation systems.
- Q.2 Attempt any two of the following 12**
- Describe the types of cameras commonly used in robots.
  - What is visual sensing in robotics, and why is it important?
  - Explain the concept of edge detection in image processing.
  - Write a short note on feedback (closed-loop) control systems.
- Q.3 Attempt any two of the following 12**
- What does 'cost' refer to in robotic planning?
  - Provide examples of navigation and path planning in robotic systems.
  - Explain the concept of hybrid control systems in robotics.
  - Discuss different action selection mechanisms.
- Q.4 Attempt any two of the following 12**
- What are the limitations of Dijkstra's Algorithm?
  - Provide an example where Brute Force Search is applicable.
  - What does admissibility mean in the context of A\*?
  - Discuss the advantages of Tabu Search.
- Q.5 Attempt any two of the following 12**
- Differentiate between passive and active sensors.
  - Write a short note on Biological Vision.
  - Discuss the importance of planning in autonomous robots.
  - Discuss the role of heuristics in refined search.

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