

# 22589

**23124**

**3 Hours / 70 Marks**

Seat No. 

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- 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) 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 examples of agents.
  - b) List different types of uninformed search algorithms.
  - c) Define Machine Learning.
  - d) Define accuracy, precision w.r.t evaluation metrics.
  - e) List classification supervised ML algorithms. (any 4)
  - f) Define observability w.r.t. environment.
  - g) List various cross validation methods in machine learning.
- 2. Attempt any THREE of the following: 12**
- a) Define initial state, action, plan and path cost w.r.t state space search.
  - b) List key issues of search algorithm.
  - c) Explain confusion matrix with one example.
  - d) List any 4 key points of support vector machine algorithm.

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- 3. Attempt any THREE of the following:** **12**
- a) Define the following properties of environment
    - i) single agent/multiple agent
    - ii) accessible/inaccessible
    - iii) Episodic/Non-episodic
    - iv) Discrete/continuous
  - b) Explain node data structure in search algorithm.
  - c) Explain bivariate analysis data exploration.
  - d) List key points of K-means clustering algorithm. (any 4)
- 4. Attempt any THREE of the following:** **12**
- a) Solve Pegs and Disks state space problem
  - b) Classify machine learning and explain.
  - c) Explain variable transformation w.r.t data exploration in machine learning..
  - d) Explain Binary, Multiclass and Multilabel classification
  - e) Explain the Steps to read csv and excel file in Jupyter notebook inside pandas.
- 5. Attempt any TWO of the following:** **12**
- a) Explain the stages of machine learning pipe line.
  - b) Implement simple linear regression algorithm.
  - c) Differentiate supervised and unsupervised learning. (any 6 points)
- 6. Attempt any TWO of the following:** **12**
- a) Explain different stages of Data exploration.
  - b) Differentiate Logistic regression and Support vector machine (any 6 points)
  - c) Explain the following applications of AI and ML in robotics.
    - i. Computer vision
    - ii. AI enabled manipulation and grasping
    - iii. Natural language processing.
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