Time: (3 Hours) [Total Marks: 80]

N.B.: 1) Question No. 1 is compulsory.
2) Answer any three out of remaining questions.
3) Assume suitable data if necessary.
4) Figures to the right indicate full marks.

Q1. (a) Briefly explain properties of knowledge representation system. **(5)**
Q1. (b) Differentiate between partial order planning and hierarchical planning. **(5)**
Q1. (c) List down Big Data Characteristics. **(5)**
Q1. (d) Compare OLTP and OLAP. List one example of each, **(5)**

Q2. (a) Define Data Mining. What are the issues in data mining?, **(10)**
(b) Define agent. List different types of agents. Explain Goal based and utility-based agents. **(10)**

Q3. (a) With a neat Diagram explain the components of Expert System. **(10)**
(b) List Big data characteristics. Explain Massively Parallel Processing (MPP) architecture. **(10)**

Q4. (a) Differentiate between supervised and unsupervised learning. Explain briefly different classification algorithms. **(10)**
(b) what is data warehouse? Explain the architecture of data warehouse. Differentiate between Logic driven modeling, data driven modeling. **(10)**

Q5. (a) Why is dimensionality reduction important? How feature extraction is different from feature selection? **(10)**
(b) Explain Data Pre-processing. What are the methods of handling incomplete data? Explain by giving examples. **(10)**

Q6. Explain **any Two:** **(20)**
a) Clustering Algorithms
b) Time series Analysis and Forecasting
c) Hidden Markov model

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