

Duration: 3hrs

[Total Marks: 80]

- N.B.: 1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR 20**
- a** Differentiate between games with perfect and imperfect information. **05**
 - b** Explain strictly competitive games with an example. **05**
 - c** What are the three basic problems of Hidden Markov models (HMMs)? **05**
 - d** Explain the basic concept of Kalman filter. **05**
 - e** Explain soft margin and hard margin used in SVM for classification. **05**
 - f** List the different types of AI systems, with respect to environment. **05**
- 2 a** Define and explain Nash Equilibrium (NE). Also give the steps involved in determining NE for Matching pennies and Stag hunt. **10**
- b** Explain Market Basket Analysis, with a suitable example. **10**
- 3 a** State and explain Bertrand's model of oligopoly. **10**
- b** Determine the line of best fit for the below data, using least square method. **10**
- | | | | | | | |
|----------------------|----|----|----|----|----|----|
| Age | 43 | 21 | 25 | 42 | 57 | 59 |
| Glucose level | 99 | 65 | 79 | 75 | 87 | 81 |
- 4 a** Explain Bayesian games. Also give two examples concerning information, in Bayesian games. **10**
- b** Explain Hill climbing algorithm in AI. Also, explain in brief, the different types of Hill climbing algorithms and their limitations. **10**
- 5 a** Explain K-means algorithm, Show the steps involved in K-means algorithm for clustering a given set of points, by taking an example. **10**
- b** Explain Bayesian network with an example. Also discuss about probabilistic reasoning over time and uncertainty. **10**
- 6 a** Explain HMM. Show how the state sequence is determined in HMM, using an example. **10**
- b** What is Logistic regression? Explain how the coefficients are best fit in logistic regression, using Maximum Likelihood estimation. **10**
