**Duration: 3 hrs** **[Max Marks: 80]**

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

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|---|---|---|---|
| 1 | | Attempt any **FOUR** | **[20]** |
| | a | What is opinion mining? List the challenges of opinion mining? | **[5]** |
| | b | What are the types of spamming techniques? Explain any two techniques in detail. | **[5]** |
| | c | Compare Hidden Markovian Models (HMM) with Conditional Random Fields (CRF). | **[5]** |
| | d | Explain N-gram modeling and its applications. | **[5]** |
| | e | What are the challenges of social media mining? | **[5]** |
| 2 | a | Explain with block diagram Named Entity Recognition application. | **[10]** |
| | b | Discuss any two Distance-based Clustering Algorithms. | **[10]** |
| 3 | a | What is Latent Semantic Indexing? What are the benefits of Latent Semantic Indexing? | **[10]** |
| | b | Explain the working of opinion spam detection application | **[10]** |
| 4 | a | Write a short note on K-NN classifier. | **[10]** |
| | b | Explain different data sources and the web usage mining process in detail. | **[10]** |
| 5 | a | Explain feature selection techniques for text document classification. | **[10]** |
| | b | What are the different types of social media graphs? Explain recommendations using social context in detail. | **[10]** |
| 6 | a | Explain the working of web search engine. | **[10]** |
| | b | Explain the supervised techniques of sentiment classification. | **[10]** |

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