

Model Paper-1

Research Issues in AI and Data Engineering

Answer any 5 questions.

Max. Time: 3 Hrs

All questions carry equal marks.

Max. Marks: 100

1. a) Discuss the characteristics of the following problems and discuss the suitability of various heuristic search algorithms and their limitations to solve these problems.
i) 8-puzzle problem ii) chess playing problem (6+6)
- b) Discuss various kinds of uncertainty in AI problem solving and explain in detail how Non-monotonic reasoning systems deal with incomplete data to draw conclusions with an example. (8)
2. a) Explain various phases of natural language understanding. (10)
- b) Discuss how neural networks support supervised learning to solve AI problems. (10)
3. a) Discuss various approaches to deal with noisy data to prepare it for pattern mining. (8)
- b) Discuss an association mining algorithm for extracting frequent itemsets from a large transaction database without generating candidate itemsets. (12)
4. Discuss the pros and cons of the following approaches for data classification: (20)
i) Decision trees ii) K-nearest neighbors iii) Support Vector machines
5. a) Give comparative study on image filters and their advantages. (10)
- b) Explain features and challenges of Color Image Processing. (10)
6. a) Describe Image Segmentation techniques. (10)
- b) Describe decision of contrast based on Histogram. (10)
7. Explain the techniques used for unstructured data analysis and reporting of big data.
8. a) Describe the 3 alternative approaches which make an organization migrate from their current platforms. (10)
- b) What are the phases in an Analytics Business Maturity model? (10)

Model Paper-2

Research Issues in Software Engineering, Networks and Security

Answer any 5 questions.

Max. Time: 3 Hrs

All questions carry equal marks.

Max. Marks: 100

1. a) Write a report that gives an overview of the Spiral software lifecycle model, and demonstrate how it might be used to plan, organize, and run new software development projects in commercial enterprises. (10)
b) Describe the framework of CMM Process model. Outline its capability levels, key process areas and key practices. (10)
2. a) What are the languages and models used for representing requirements? Discuss them.
b) Explain what is meant by software product complexity, and demonstrate how measures of module coupling, cohesion, and size can help the engineer monitor the build quality of software. (10)
3. a) Explain in detail, how communication is taking place starting from connection establishment, data transfer and connection termination in
(i) Circuit switching (ii) Packet switching. (10)
b) What are the requirements to connect two different networks (Ethernet and Token ring) in the lower layers? (10)
4. a) Explain cell delineation state diagram during Transmission of ATM Cells. (10)
b) Explain the requirements for ATM traffic and congestion control. (10)
5. a) What is MANET? How is it different from cellular system? What are the essential features of MANET? (10)
b) What are the applications of MANET? Explain in detail about Mobile IP. (10)
6. a) What are the challenges and the required mechanisms of a Wireless Sensor network. (10)
b) What are the various applications of wireless sensor networks and explain any two with suitable examples. (10)
7. a) What is a digital signature? What are its requirements? Discuss direct digital signatures and arbitrated digital signatures. (10)
b) Write the digital signature algorithm. With block diagrams, explain functions of signing and verification of digital signatures. (10)
8. a) Explain in detail about definition, characteristics, types and limitations of firewalls. (10)
b) Explain X.509 Authentication service. (10)