



Seat No. : \_\_\_\_\_

# DQ-111

December-2025

## 5 Year Integrated M.Sc. (CS), Sem.-V Artificial Intelligence

Time : 2:00 Hours]

[Max. Marks : 25

1. (A) Explain the concept of Intelligent Agents. Discuss agent architecture, list types of agents, and PEAS representation with suitable examples. **6**
- (B) (1) List characteristics of production systems. **4**  
(2) Define AI and list any four areas where AI is used. **4**

**OR**

1. (A) Write a detailed note on Iterative Deepening A (IDA). Explain why it is memory efficient and compare it with A\* illustrate with example. **6**
- (B) (1) Write two differences between informed and uninformed search. **4**  
(2) Give limitations of hill climbing search. **4**
2. (A) Discuss Computable Functions and Predicates. Explain how functions, predicates, and quantifiers help in representing knowledge in FOPL. **6**
- (B) (1) Give differences between propositional logic and predicate logic. **4**  
(2) Write predicates and then draw a semantic network that represents the following information : **4**
- (1) A Dog and a Cat are both Mammals.  
(2) A Mammal is an Animal.  
(3) A Dog can bark.  
(4) A Cat can purr.  
(5) Both Dog and Cat have a tail.  
(6) A Sparrow is a Bird, and a Bird is an Animal.  
(7) A Sparrow can fly.

**OR**

2. (A) Discuss the two types of knowledge (Procedural and Declarative Knowledge).  
Classify all KR Techniques based on these two knowledge. 6
- (B) (1) What are primitive acts in Conceptual Dependency ? Name any four.  
(2) Provide four distinct differences between Forward and Backward chaining. 4
3. Attempt any **five** : 5
- (1) The process of removing unnecessary branches in search is called \_\_\_\_\_.
- (2) The problem of getting stuck at a local maximum in hill climbing is called the \_\_\_\_\_ problem.
- (3) Forward chaining is \_\_\_\_\_ driven.
- (4) Backward chaining is \_\_\_\_\_ driven.
- (5) Partitioned semantic nets divide knowledge into multiple sections or spaces. (T/F)
- (6) Breadth-First Search is guaranteed to find the optimal solution if all step costs are equal. (T/F)
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# DQ-111

December-2025

5 Year Integrated M.Sc. (CS), Sem.-V (NEP)

Block-chain Technology

Time : 2:00 Hours]

[Max. Marks : 25

1. (A) Explain the role of cryptography in blockchain. Describe hashing, public – private keys, and digital signatures and how they ensure security and immutability in blockchain. 5
- (B) Describe the components of a blockchain (blocks, chain, nodes, miners / validators). Explain the structure of a block and compare public, private, and consortium blockchains. 5

OR

1. (A) What is a consensus mechanism ? Explain why decentralized systems need consensus. Describe any two consensus algorithms (PoW, PoS, PBFT, etc.) in detail. 5
- (B) Explain cryptocurrency basics. Discuss crypto mining, airdrops, token burning, ecosystem players, and security best practices. 5
2. (A) Explain public blockchain systems. Describe Bitcoin's working, Ethereum architecture, and smart contracts with examples. 5
- (B) Discuss private blockchains, compare them with public blockchains, and explain consortium blockchains, and open-source frameworks like Hyperledger. 5

OR

2. (A) Define ICO. Explain ICO launching steps, characteristics, fundraising models, advantages, limitations, and the working of ICO platforms. **5**
- (B) Explain security aspects in Bitcoin. Discuss blockchain challenges such as scalability, performance, identity management, and smart contract vulnerabilities. **5**
3. Short Answers (1 Mark each) **5**
- (A) How does a blockchain prevent data tampering without a central authority ?
- (B) How does blockchain prevent double spending ?
- (C) What is a peer-to-peer (P2P) network ?
- (D) What is DLT (Distributed Ledger Technology) ?
- (E) What is the purpose of a consensus mechanism ?
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