**MCA 2 Sem Imp List**

**1. Probability, Statistics and Queuing Theory – Important Questions**

1. Define probability. Explain types with examples.
2. State and explain Bayes’ Theorem.
3. What is a random variable? Give types and examples.
4. Explain the properties of a Normal distribution.
5. Differentiate between discrete and continuous distributions.
6. Explain Mean, Median, and Mode with formulas.
7. What is standard deviation? How is it calculated?
8. Define correlation. Explain Karl Pearson's coefficient.
9. Define regression. How is it different from correlation?
10. Derive the formula for expected value.
11. What is Poisson distribution? Write its properties.
12. Explain the Law of Large Numbers.
13. Explain Queuing Theory. List its assumptions.
14. What is M/M/1 queue model? Explain with example.
15. Define arrival rate and service rate.
16. Explain priority queues.
17. What is Little’s Law?
18. Difference between single-server and multi-server queue.
19. What is simulation? Explain its role in queuing theory.
20. Applications of Queuing theory in real life.

**📗 2. Information Systems and Organizational Behavior – Important Questions**

1. Define Information System. Explain its types.
2. Components of Management Information System (MIS).
3. Explain Decision Support System (DSS).
4. What is E-Governance? Mention its benefits.
5. What is ERP? Explain with examples.
6. Explain the structure of an organization.
7. Define Organizational Behavior. Scope and importance.
8. What is motivation? Explain Maslow’s theory.
9. Difference between leadership and management.
10. Discuss different styles of leadership.
11. Define communication. Explain its process and barriers.
12. What is group behavior? Explain its characteristics.
13. Explain change management and its process.
14. What is organizational culture?
15. What is resistance to change? How to manage it?
16. What is transactional analysis?
17. Explain Johari Window model.
18. What is job satisfaction? Factors affecting it.
19. Define team dynamics.
20. Applications of OB in IT industry.

**📙 3. Object Oriented Programming through JAVA – Important Questions**

1. Principles of OOPs.
2. Define class and object with Java example.
3. Constructor vs method in Java.
4. What is inheritance? Types with code.
5. Explain polymorphism with method overloading and overriding.
6. Abstract class vs interface.
7. What is exception handling? Types of exceptions.
8. Try-catch-finally block with example.
9. Explain multithreading. Lifecycle of a thread.
10. Difference between process and thread.
11. Synchronization in Java.
12. Explain static and final keywords.
13. File handling in Java: read, write example.
14. What is package and how to create it?
15. Access modifiers in Java.
16. Write a program to implement interfaces.
17. GUI programming using Swing.
18. Collections framework overview.
19. Use of super and this keywords.
20. Java Virtual Machine (JVM) – role and features.

**📕 4. Formal Languages and Automata Theory – Important Questions**

1. What is grammar? Types of grammar (Chomsky hierarchy).
2. Define Finite Automaton. Explain DFA with diagram.
3. Difference between DFA and NFA.
4. Convert NFA to DFA (step-by-step example).
5. Write regular expressions for binary numbers divisible by 2.
6. Explain ε-NFA with example.
7. Define Pumping Lemma. Use it to prove language is not regular.
8. What is a context-free grammar (CFG)?
9. Explain Pushdown Automaton with example.
10. Derivation tree and ambiguity in CFG.
11. Simplification of context-free grammars.
12. Difference between regular and context-free languages.
13. Explain Turing Machine with example.
14. Applications of Finite Automata in real life.
15. What is language hierarchy?
16. Explain leftmost and rightmost derivations.
17. Explain Moore and Mealy machines.
18. What is undecidability?
19. Recursive vs recursively enumerable languages.
20. Applications of automata in compilers.

**📒 5. Web Technologies – Important Questions**

1. Create a simple HTML page with headings, lists, and images.
2. Difference between HTML and XHTML.
3. Explain types of CSS: Inline, Internal, External.
4. JavaScript data types and variables.
5. DOM model in JavaScript.
6. Form validation using JavaScript.
7. Difference between GET and POST methods.
8. Explain client-side vs server-side scripting.
9. Write JavaScript to perform arithmetic operations.
10. Introduction to Bootstrap framework.
11. Structure of a basic HTML5 document.
12. Difference between HTML and XML.
13. Explain responsive web design.
14. Create a navigation bar using HTML and CSS.
15. Use of <div> and <span> tags with examples.
16. Event handling in JavaScript.
17. JavaScript popup boxes (alert, confirm, prompt).
18. Form elements in HTML5.
19. Explain AJAX with example.
20. What are cookies and sessions?