Part I: Structure of Papers 1 and 2 in 2019

**Paper 1**

**Section A**  
*Attempt 1 question*  
1. Foundations of Computer Science  
2. Foundations of Computer Science

**Section B**  
*Attempt 1 question*  
3. Object-Oriented Programming  
4. Object-Oriented Programming

**Section C**  
*Attempt 1 question*  
5. Numerical Analysis  
6. Numerical Analysis

**Section D**  
*Attempt 2 questions*  
7. Algorithms  
8. Algorithms  
9. Algorithms  
10. Algorithms

**Attempt five questions on each paper.**

**Paper 2**

**Section A**  
*Attempt 1 question*  
1. Digital Electronics  
2. Digital Electronics

**Section B**  
*Attempt 1 question*  
3. Operating Systems  
4. Operating Systems

**Section C**  
*Attempt 1 question*  
5. Software and Security Engineering  

**Section D**  
*Attempt 2 questions*  
7. Discrete Mathematics  
8. Discrete Mathematics  
9. Discrete Mathematics  
10. Discrete Mathematics
Paper 3

Section A
Attempt 1 question
1. Databases
2. Databases

Section B
Attempt 1 question
3. Introduction to Graphics
4. Introduction to Graphics

Section C
Attempt 1 question
5. Interaction Design
6. Interaction Design

Section D
Attempt 2 questions
7. Machine Learning and Real-world Data
8. Machine Learning and Real-world Data
9. Machine Learning and Real-world Data

Attempt five questions on the paper.
Part Ib: Structure of Papers 4 to 6 in 2019

Paper 4

Section A
Attempt up to 4 questions from Section A
1. Programming in C
2. Programming in C and C++
3. Compiler Construction
4. Compiler Construction
5. Further Java
6. Security
7. Security

Section B
Attempt at least 1 question from Section B
8. Semantics of Programming Languages
9. Semantics of Programming Languages

Paper 5

1. Computer Design
2. Computer Design
3. Computer Design
4. Computer Networking
5. Computer Networking
6. Computer Networking
7. Concurrent and Distributed Systems
8. Concurrent and Distributed Systems

Paper 6

1. Artificial Intelligence
2. Artificial Intelligence
3. Complexity Theory
4. Complexity Theory
5. Computation Theory
6. Computation Theory
7. Foundations of Data Science
8. Foundations of Data Science
9. Logic and Proof
10. Logic and Proof

Attempt five questions on paper 4 including at least one from Section B. Attempt any five questions on each of papers 5 and 6.
Part Ib (75%), Part II (50%): Structure of Paper 7 in 2019

Paper 7
1. Concepts in Programming Languages
2. Economics, Law and Ethics
3. Economics, Law and Ethics
4. Formal Models of Language
5. Formal Models of Language
6. Further Graphics
7. Further Graphics
8. Further HCI
9. Further HCI
10. Prolog

Part II (50%) only
11. Digital Signal Processing

Attempt any five questions on the paper.
Part II: Structure of Papers 8 and 9 in 2019

Paper 8
1. Advanced Algorithms
2. Bioinformatics
3. Comparative Architectures
4. Computer Vision
5. Cryptography
6. E-Commerce
7. Hoare Logic and Model Checking
8. Information Theory
9. Machine Learning and Bayesian Inference
10. Mobile and Sensor Systems
11. Optimising Compilers
12. Principles of Communications
13. Types

Paper 9
1. Advanced Algorithms
2. Bioinformatics
3. Business Studies
4. Comparative Architectures
5. Computer Vision
6. Cryptography
7. Denotational Semantics
8. Hoare Logic and Model Checking
9. Information Theory
10. Mobile and Sensor Systems
11. Optimising Compilers
12. Principles of Communications
13. Quantum Computing
14. Types

Attempt any five questions on each paper.