### 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 Methods
6. Numerical Methods

**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

*Attempt five questions on each paper.*
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 I:
Structure of Papers 4 to 6 in 2018

Paper 4

Section A
Attempt up to 4 questions from Section A
1. Programming in C
2. Programming in 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%): Structure of Paper 7 in 2018

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

Attempt any five questions on the paper.
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**Part II: Structure of Papers 7 to 9 in 2018**

**Paper 7**
1. Advanced Algorithms
2. Advanced Graphics
3. Bioinformatics
4. Business Studies
5. Comparative Architectures
6. Denotational Semantics
7. Hoare Logic and Model Checking
8. Human–Computer Interaction
9. Information Theory
10. Machine Learning and Bayesian Inference
11. Natural Language Processing
12. Optimising Compilers
13. Principles of Communications
14. Security II

**Paper 8**
1. Advanced Graphics
2. Comparative Architectures
3. Computer Systems Modelling
4. Computer Vision
5. Digital Signal Processing
6. E-Commerce
7. Information Retrieval
8. Machine Learning and Bayesian Inference
9. Mobile and Sensor Systems
10. Principles of Communications
11. Quantum Computing
12. Security II
13. System-on-Chip Design
14. Types

**Paper 9**
1. Advanced Algorithms
2. Bioinformatics
3. Computer Systems Modelling
4. Computer Vision
5. Denotational Semantics
6. Digital Signal Processing
7. Hoare Logic and Model Checking
8. Information Theory
9. Mobile and Sensor Systems
10. Natural Language Processing
11. Optimising Compilers
12. Principles of Communications
13. System-on-Chip Design
14. Topical Issues
15. Types

*Attempt any five questions on each paper.*