There are two parts to this paper. Part A is worth 40 marks, and Part B is worth 40 marks. Each question in Part A is worth 1 mark for a correct answer, and 0 marks for an incorrect answer. There are 11 questions in Part B; each question carries the stated number of marks, and part marks will be awarded for correct working.

There are some formulae on the last page of this paper.

Write your answers (including rough working in Part B), in the space provided. If you need extra room, use the back of other pages. You will be issued with a single sheet of blank paper. During perusal, you may write on the blank sheet, but not on this exam booklet. Do not write on the single sheet once perusal is over. Your single sheet will be collected with your exam script and will be destroyed (so material written on that sheet will not be assessed).

This sample exam shows what to expect on your real exam. The number of marks for each question is shown here, along with some practice questions from your study guide that cover the same topic. Note that the study guide includes worked solutions to all of the questions. Your exam has the same cover sheet as this sample, and has the same formula sheet at the end. I think this is a very useful study guide!
Part A

For each of the following 26 questions, enter the correct value of \( x \) into the corresponding box. There is no need to show any working. Each correct answer is worth 1 mark; each incorrect answer is worth 0 marks. (Hint: in each case, \( x \) is an integer between \(-6\) and \(6\) inclusive.)

For practice questions, try:

- Questions 1 to 32 on Page 82 of your Study Guide, but not Questions 1, 2, 5, 6, 7, 11, 14, 15, 21, 22, 23, 24, 30, 31 or 32.

- Questions 1 to 22 on Page 88 of your Study Guide, but not Questions 1, 2, 5, 6, 7, 11, 17 or 18.

- Questions 1 to 20 on Page 94 of your Study Guide, but not Questions 1, 2, 5, 6, 7, 17 or 18.

- Questions 1 to 13 on Page 100 of your Study Guide, but not Questions 1, 2, 4, 8, 9 or 13.

For each of the following nine multiple choice questions, enter the letter corresponding to the correct answer in the corresponding box. There is no need to show any working. Each correct answer is worth 1 mark; each incorrect answer is worth 0 marks.

For practice questions, try:

- Multiple choice Questions 1 to 6 on Pages 82 to 83 of your Study Guide, but not Questions 1 or 2.

- Multiple choice Questions 1 to 10 on Pages 88 to 89 of your Study Guide, but not Questions 2, 3, 7 or 10.

- Multiple choice Questions 1 to 13 on Pages 94 to 95 of your Study Guide, but not Questions 2, 3, 7, 10, 11 or 12.

- Multiple choice Questions 1 to 10 on Pages 100 to 101 of your Study Guide, but not Questions 2, 3, 7 or 10.

The next question involves Venn diagrams, sets, expressions involving sets and so on. There are 5 parts; each correct answer is worth 1 mark, and each incorrect answer is worth 0 marks. The questions are not very hard; see tute sheets or lectures for examples.

Part B

Each of the following questions carries the stated number of marks. Write your answers in the space provided. Part marks will be awarded for correct working.

1. See the Study Guide, for example Question 1 Page 95, Question 1 Page 101, Question 1 Page 83 or Question 1 Page 89. (3 marks)
2. Three parts worth 3 marks, 1 mark and 1 mark. See the Study Guide, for example Q6 P96, Q6 P102, Q6 P90, Q3 P83, Q2 P106.

3. See the Study Guide, for example Q8 P96, Q8 P102, Q5 P84, Q9 P90. (2 marks)

4. (Similar to Q3). See the Study Guide, for example Q8 P96, Q8 P102, Q5 P84, Q9 P90. (3 marks)

5. See the Study Guide, for example Q2 P89, Q2 P95. (2 marks)

6. See the Study Guide, for example Q2 P101, Q3 P101, Q2 P83, Q3 P96, Q3 P90. (4 marks)

7. See the Study Guide, for example Q7 P96, Q7 P90, Q4 P84. (2 marks)

8. See the Study Guide, for example Q4 P96, Q4 P102, Q4 P90, Q4 P124. (3 marks)

9. See the Study Guide, for example Q2 P83, Q3 P101. (3 marks)

10. Seven parts, worth 1 mark each. See the Study Guide, for example Q3 P106, Q7 P124, Q7 P118, Q7 P112.

11. A mystery question, involving sigma. Two parts, worth 3 marks each.

Some formulae:

Principle of inclusion/exclusion: \[ P(A \cup B) = P(A) + P(B) - P(A \cap B) \]

Conditional probability: \[ P(A|B) = \frac{P(A \cap B)}{P(B)} \]