Comments

Section A

General Feedback:
• Among 192 students, 80% students answered question 1 and 20% students answered question 2. The reason behind (as the previous years) is that the students did a lab exercise related to Question 1 and so they are more familiar to the related topic.
• The average mark for Section A is 57%, in which the average mark for question 1 is 55.5% whereas the average mark for question 2 is 61.4%. Therefore question 1 is a little more difficult for the students, as the average mark is lower. As it had always been the case that Question 2 had the lower average mark and fewer students took Question 2 during the previous years, Question 2 was designed to be a little easier. However, it is still much more students taking Question 1 due to the reason stated above.
• 42 or 21.8% students received a mark of less than 40% (i.e., 7 marks or less).
• 66 or 34.3% students received a mark of 70% or better (i.e., 14 marks or more), 52 or 27% received a mark between 60% and 69%, and 32 or 16.7% received a mark between 40% and 49%.
• Generally speaking, the students’ performance in Section A is relatively satisfactory with the average mark as 57%. However, it is disappointing to see that 21.8% students failed, as this is higher than the previous years.

Detailed Feedback for Question 1:
• Question a). Most students answered this question correctly.
• Question b). The question is to prove that under the condition. More than half students answered this question correctly. The common mistakes are that the proof for was given incompletely or incorrectly.
• Question c.i) Most students answered this question correctly.
• Question c.ii) More than half students answered this question correctly. The question asked the students to use the property of the partition to calculate the probabilities that a robot is located at a position and an orientation, from the known probabilities of the robot being located at each pose. The comment mistakes are that, firstly some students did not fully understand that the relationship between the pose, position and orientation; secondly calculated the probabilities by assuming the even distributions for each position or orientation; thirdly calculated incorrectly or used the wrong formulas.
• Question c.iii) Most students answered these questions correctly. The common mistake is calculation errors.
• Question c.iv) This is a more difficult question and about half students answered this question correctly. Some students did not know how to answer this question, or used wrong formulas, or made the calculation mistakes.

Detailed Feedback for Question 2:
• Question a). This question asked what Dutch book is. Most students know how to answer this question, but some missed the important assumption that each bet should be fair in the definition of Dutch book and so incomplete.
• Question b.i). The question asked is, under condition, whether Dutch book occurs. More than half students answered this question incorrectly. Many of these students used the given probabilities to imply or assumed, then gave the wrong conclusion that Dutch book does not occur. This mistake is unexpected in some degree.
• Question b.ii). Most students answered these questions correctly.
• Question c). Most students answered these questions correctly.
• Question d). More than half students answered this question correctly. The common mistakes are, firstly some used the intuitive reasoning rather than Bayes’ theorem required; secondly some missed some necessary steps or gave an incomplete answer; thirdly some provides incorrect calculation.

Section B

Question 3

Very few students answered question 3, in fact most of the candidates who answered this question also answered question 4, despite the rubric requiring one question from each section to be answered. The question was answered well, but most failed to provide the comment about the classifier performing badly, so losing a possible 2 marks.

Question 4

Most candidates answered this question. It was very well done, the marking scheme made it easy to get at least 50%, provided the notes that I provided had been read. Most who lost marks did so by being careless in finding the length=4 sequences and multiplying up their probabilities, or by making other careless mistakes.
The bookwork sections of the question were mostly answered correctly. Most students remembered the properties of the MM that enabled the probabilities to be calculated.
The calculation was straightforward, provided the rule for computing it was remembered correctly and the complete set of transitions was recognised. Some credit was given to students who identified the wrong set of transitions but obtained the correct probabilities for their data. Most students seemed to use a calculator for the calculation, without realising that most of the transition probabilities would cancel leaving a very simple ratio.
The final part of the question was not well answered, few people realised that the extension was simply to convert the MM into a HMM – adding the emission probabilities at each state and to process the raw data to get at the sequence of phonemes.