Marks

Question 26 — Decision Support Systems (20 marks)
Use a SEPARATE writing booklet.

(a)   (i)   Define the term *structured problem* and provide an example of such a problem.   **3**

        (ii)   Define the term *certainty factor* in regard to decision-making situations and provide an example of a situation where one would be used.   **3**

(b)   Gertrude's mobile phone contract is about to expire and she needs to choose a new plan. She has identified three plans for people who already own their own phone.

The first plan is from Toady Phones. The monthly connection fee is $0, and each call costs 1 cent per second. This plan has no free calls per month.

The second plan is from Monopoly Mobile. The monthly connection fee is $14.50, and each call is charged at 0.75 cents per second. This plan includes $10 of free calls per month.

The third plan is from Shakey Service. The monthly connection fee is $28.50, each call costs 0.5 cents per second, and $15 of free calls per month are included.

Monthly charges are calculated by adding the monthly connection fee to the monthly call cost. The monthly call costs are calculated by subtracting the free call amount from the actual call costs (time × cents per second). However, if the actual call cost is less than the free call amount the monthly call cost is $0.00.

None of the plans have a flag fall (cost to establish each call) or allow unused monthly free calls to be carried over.

    (i)   Gertrude's use of her mobile phone varies greatly from month to month. Design a spreadsheet that would assist Gertrude to explore a range of usage alternatives and select the cheapest plan. Show all relevant data and formulae.   **5**

    (ii)   Outline how different types of graphs could assist Gertrude's decision making.   **3**

Marks

Question 26 (continued)

(c) Deiciding which university degree to apply for can be a long and frustrating **6**
process.

Kim and Hendra have developed a Decision Support System (DSS) that will
assist their fellow Year 11 and Year 12 students identify university degrees that
suit their needs and abilities.

Kim and Hendra have used the following decision criteria:

- The student's area of interest
- The Universities Admission Index (UAI) the student expects to obtain
- Whether the student wants to study at a local university
- Whether a small or large university is preferred.

The information for the system was collected from university websites and
includes degree name, degree detail, the UAI required for each degree in the
previous year, and the university location, size and distance from Kim and
Hendra's high school.

Describe and analyse the decision support system in terms of the information
processes of:

- organising;
- analysing;
- processing.

End of Question 26