

QUESTION 1

This question required a number of routine skills that can be taught:

- In teaching SQL, teachers must note (and emphasise in class) that the SQL must be a STRING, i.e. in double quotation marks “ ”. The string does not require underscores or internal punctuation. Inside the SQL string, SQL words are supposed to be written in CAPITAL letters for easy recognition and a specific order is expected (SELECT ... FROM WHERE ... etc). Strings to be inserted or compared need single quotation marks ‘ ’, while numbers (usually integers) do not. The most difficult part is inserting variables that have been read from keyboard when the variables have to be concatenated into the correct position in the string. Only when this is done correctly will the SQL execute and give feedback on the logic of the selection.
- It must be taught that there are 2 modes in SQL: **Read mode** (prefaced with the key word SELECT ... and executed with the command “executeQuery”) and **write mode** (prefaced with the key words UPDATE for editing of existing records and INSERT for the insertion of new records, both of which are executed with the command “executeUpdate”). The correct instructions to the program are as much part of SQL as the correctness of the SQL strings.
- While the processing of the result set of select queries has not been part of the exam papers up to now, it forms an integral part of SQL, especially as the names of fields and aliases have to match both the SQL string and their call in the result set.

QUESTION 2

This question also required a number of routine skills that can be taught:

- The structure of objects must be taught: Attributes, constructors, mutators (SETS), accessors (GETS), toString() and other methods.
- Likewise, candidates must learn how to read a text file and convert the information into an array of objects, as well to extract certain information and summaries from that array.
- It is a useful skill to know how to check for the existence of a file (by either creating a file object and then using its exist() method, or by placing it in a try .. catch block) to prevent the program from crashing if the file does not exist (or for overwriting an existing file in write mode).
- Learners must be taught to exit a program with the System.exit(0) command, often used in conjunction with a time delay (e.g. Thread.sleep(1000)).

QUESTION 3

Problem-solving and dealing with the unexpected (but not unfamiliar) is very much part of Information Technology.

- Two-dimensional arrays must be taught. Teachers must go beyond square matrices and practise 2D arrays with different sizes (different values for rows and columns) and how to transpose the matrix, if required. Likewise, adding of numbers in a 2D array must be practised for **both** rows and columns, as well as searching for specific, highest or lowest values in the 2D array.
- The correct division of number-different types (integers vs doubles) must be taught, as well as how to ensure that there are in fact decimal places (merely casting the result into a double does not suffice). Likewise, the efficient rounding off to a given number of decimal places (using the DecimalFormat class or the Math.round() command) must also be taught.