

IB Computer Science 2

Examination Preparation Worksheet 1

2 point questions (time allocated – 10 minutes)

November 2006

4. Identify the data structure that would be most suitable for the processing of the following sets of data:
- (a) rainfall data for several cities for each month of a year [1 mark]
 - (b) personnel data for the employees of a company. [1 mark]
2. Suggest **two** ways in which the introduction of a microprocessor into the design of a car could improve its safety features. [2 marks]

May 2006

8. Define the terms *function argument* and *function parameter*. [2 marks]

November 2005

9. Describe the function of a *defragmentation utility*. [2 marks]
3. A satellite transmits data at 64 Kilobits per second. Calculate the approximate total storage requirements for storing 1 hour of data, and state the answer as a number of **Megabytes**. [2 marks]

3 point questions (time allocated – 15 minutes)

November 2006

5. Explain how the use of *check sums* could ensure that *data integrity* is maintained during the transmission of text. [3 marks]
10. Banks make extensive use of computer systems in the running of their operations. Identify a situation in which banks would make use of each of the following types of processing:
- (a) real-time [1 mark]
 - (b) batch [1 mark]
 - (c) interactive. [1 mark]

May 2006

11. (a) Trace the following algorithmic extract for an input of 34. [2 marks]
- ```
{input (i);
 k = i mod 6;
 m = i div 6;
 output (m*6+k);
}
```
- (b) Determine the output if any integer, n, is input. [1 mark]

#### Nov 2004

2. Two search algorithms are *binary search* and *sequential search*.
- (a) Outline a set of data, stored in an array, for which a *binary search* cannot be used. This must include at least **four** sample data items, and clearly state the reason that a *binary search* cannot be used. [2 marks]
  - (b) State which search algorithm (*binary* or *sequential*) is more efficient on large sets of data in the situation where either can be used. [1 mark]
5. A multimedia software utility retrieves data from a hard-disk at a speed of 5 MB per second.
- (a) Calculate the *data-transfer* rate in kb per second. [2 marks]
  - (b) State whether *digital-to-analog* conversion is performed by *multimedia software*, a *hardware device*, or the *operating system*. [1 mark]

## 4 point questions (time allocated – 20 minutes)

### November 2006

12. An 8-bit register is used to represent integers in two's complement.

For example:

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
|---|---|---|---|---|---|---|---|

is the representation of  $46_{10}$ .

Determine the binary representation and calculate the decimal value of

- (a) the largest number that can be stored. [2 marks]
- (b) the smallest (most negative) number that can be stored. [2 marks]

### November 2005

7. (a) State whether a disk-drive normally uses direct-access, sequential access, or neither. [1 mark]
- (b) State whether a tape-drive normally uses direct-access, sequential access, or neither. [1 mark]
- (c) Compare the use of tape-drives for backups to the use of hard-disk drives for backups. [2 marks]
10. A hotel keeps their financial records in a computer database, this includes names, addresses and salaries of employees. The hotel's management wishes to expand the use of computers to track customer information (name, address, phone, etc.). They hope to use this new database for advertising and to analyze the numbers of customers and frequencies of visits. Hotel employees will be able to access this database when customers make reservations, check-in, and check-out of the hotel.
- (a) Identify the stage of the *software development cycle* when software developers collect needs and wishes from potential users. [1 mark]
- (b) Explain the importance of formulating the problem precisely before programmers begin writing program code. [3 marks]

### November 2004

7. (a) Describe **one** application of *sensors*. [2 marks]
- (b) Explain why the signal from a *sensor* requires conversion before processing in a computer. [2 marks]