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ST BENEDICT'S COLLEGE



SUBJECT GRADE EXAMINER NAME CLASS	Information Technology Theory	DATE	July 2013
	11	MARKS	110
	Mrs Kench	MODERATOR	Mr Gill
		DURATION	2 Hours

COGNITIVE LEVELS			
LOW ORDER	43 %	MIDDLE ORDER	32 %
		HIGH ORDER	25 %

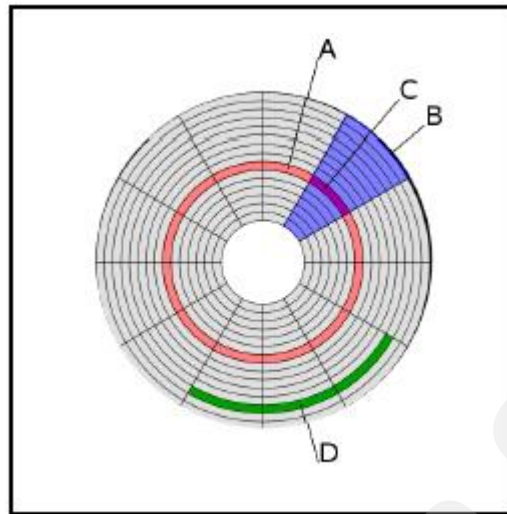
INSTRUCTIONS COMMENT	
TEACHER'S SIGNATURE PARENT'S SIGNATURE	

QUESTION 1**TERMINOLOGY****20 MARKS**

Write down the best term for the following questions.

1.1 Which shaded area in the diagram below represents a cluster of disk space?

1



- 1.2 An approach to developing software in which the code is broken down into separate classes is called..... (1)
- 1.3 A large circuit board which contains the important components of a computer is called... (1)
- 1.4 1000 or 1024 Megabytes is called a (1)
- 1.5 A field that is accessible outside a class is defined as (1)
- 1.6 The type of RAM used in cache memory. (1)
- 1.7 The time taken waiting for a component to respond is called (1)
- 1.8 The time taken for a read/write head to move to the correct track on a hard drive. (1)
- 1.9 A data type that can store only a single character. (1)
- 1.10 Methods with the same name in the same class but with different parameters. (1)
- 1.11 A sort that looks at consecutive elements and swaps them until the largest/smallest element is moved to the end of the array. (1)
- 1.12 A type of error produced when the code is unexpectedly terminated. (1)
- 1.13 A term used in Java programming where one type is changed into another type. (1)
- 1.14 A type of loop that is a post check loop (checks at the end). (1)
- 1.15 A code structure in Java that can deal with errors by terminating the code where the error occurred and then executing matching code to the type of error that occurred. (1)
- 1.16 A field that belongs to the class and a copy will not be created when an object is instantiated using the class is declared as (1)
- 1.17 A field that cannot be changed must be declared as (1)
- 1.18 A method that returns a value is declared as a.....method. (1)
- 1.19 An example of a primitive data type is (1)
- 1.20 A method in Java that will isolate one character in a String. (1)

QUESTION 2**44 MARKS**

Blue Crane Tours is a business offering sightseeing tours all over South Africa. They have offices in Cape Town with a main file server and workstations for each employee at the company. Custom software was developed and is used from this location. A database which stores information about tours and clients is managed on the server.

2.1 The senior manager at the head office complained about the performance of his computer and wanted it to be replaced. A quotation with specifications for a new computer system refers to a 266 MHz FSB.

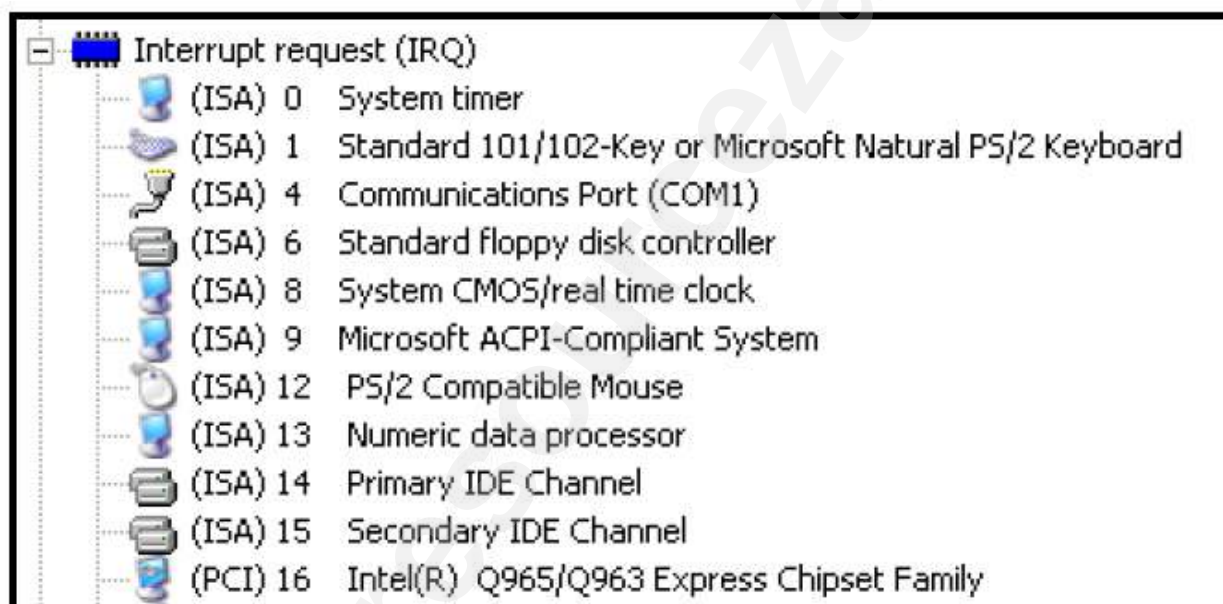
2.1.1 Explain the purpose of the Front Side Bus FSB. (2)

2.1.2 One of the ways to improve the performance of a computer is to increase the data transfer rate of the internal bus system.

(a) List the THREE types of buses that the internal bus system comprises. (3)

(b) List the functions of each of the busses you listed in 2.1.2.(a). (3)

The diagram below is an extract from the device manager of the computer currently used by the senior manager.



2.2.1 Name the manufacturer of the chipset of this computer system. (1)

2.2.2 Name the TWO different types of data that is stored in a CMOS memory chip. (2)

2.2.3 Users often confuse BIOS with CMOS. Explain the purpose of BIOS. (2)

2.2.4 Name two components attached to the Northbridge. (2)

2.2.5 Name two components attached to the Southbridge. (2)

2.2.6 The PCI bus used to connect the Northbridge to the Southbridge. This situation has been improved with the use of a new bus.

(a) Name this bus and how was this situation improved? (2)

2.2.7 Name ONE hardware device that is normally controlled by an IDE controller. (1)

2.2.8 Name a new controller that has replaced the IDE controller. (1)

2.2.9 Give TWO reasons why the PS/2 port has been replaced with a USB port on modern motherboards. (2)

- 2.3 The graphic designer at the head office wants a new computer with an Intel i7 CPU. The i7 is a quad-core 64-bit processor with the following features:
- 2.93 GHz core speed
 - 8 MB of cache memory
- 2.3.1 How many CPUs does a quad-core chip have? (1)
- 2.3.2 List FOUR steps the CPU repeats for every instruction it has to execute, which is also known as the machine cycle. (4)
- 2.3.5 The senior manager is not sure about the significance of cache memory in a computer system.
- (a) Briefly explain how cache memory works. (2)
- (b) He asks the following question: 'If cache memory is so important, why does the suggested computer only have 8 MB of cache memory?' Give TWO reasons why cache memory in computers is limited. (2)
- (c) Explain how cache is shared between multicore CPUs. (2)
- 2.4 The secretary has heard of overclocking and clock multiplication but has confused the two concepts.
- 2.4.1 Write a definition for both terms. (4)
- 2.4.2 Explain how they can both be used to increase the speed of a computer. (2)
- 2.6 Use a table to compare solid state hard drives and mechanical drives. Provide 4 facts for each device. (4)

QUESTION 3 **SORTING AND SEARCHING ALGORITHMS** **30 MARKS**

- 3.1 Explain in your own words how a selection sort works to someone who does not know how to program. (5)
- 3.2 Explain why the Improved Selection Sort is more efficient. (2)
- 3.3 Write down the **algorithm** of the Improved Selection Sort. Assume that an array called **intArr** of 10 integers needs to be sorted. (10)
- 3.4 Explain, to someone who is not a programmer, how the Binary Search works. (5)
- 3.5 Write a **Java Method** to find ALL the occurrences of the word "Help" in an array of 20 String elements called **strArr**. The array must return a String with all the positions where Help is found in the array separated by the "#" character. The method will be called by:
- ```
int numTimes = searchAll("Help");
```
- (8)

**QUESTION 4** **OBJECTS** **16 MARKS**

Your friend in class wants to store all his friend's names the highest score they have achieved in the game Mortal Combat. He wants to use parallel arrays to store the names and each person's related highest score.

- 4.1 Write the declaration for the above scenario in Java using Parallel Arrays. (6)

- 4.2 Give two reasons why an Array of Objects would be a better data structure than Parallel Arrays. (2)
- 4.3 Draw a class diagram of the object to store the friend's name and score. Include all fields and methods that you would expect to find in a class. Indicate private and public accessor modifiers with a – and +. (8)
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