



SUBJECT:	Information Technology
PAPER NUMBER:	I
DATE:	3 rd September 2018
TIME:	9:00 a.m. to 12:05 p.m.

Directions to candidates

A total of **SIX** questions must be attempted; **THREE** from Section A and another **THREE** from Section B.

SECTION A: INFORMATION SYSTEMS

Answer the first question in this section and any other TWO questions.

Question A1

This question is compulsory. Answer all parts.

- a) Based on the Waterfall model, at which stage of the systems life cycle , are the following tasks performed:
- i. migrating data from the old system;
 - ii. writing code;
 - iii. creating a data model;
 - iv. identifying user requirements;
 - v. user acceptance testing. (5)
- b) What type of system will cater for the following scenarios:
- i. diagnosis of a rare disease by a general practitioner;
 - ii. printing of a monthly report for middle management;
 - iii. enabling a senior manager to take a strategic decision;
 - iv. analysis of data in a data warehouse;
 - v. inputting of daily transactions. (5)
- c) What type of computer would the following use:
- i. a research scientist for a large number crunching operations;
 - ii. a salesperson collecting orders from shops;
 - iii. a company executive who goes abroad frequently on business;
 - iv. a call centre clerk;
 - v. a tourist on holiday. (5)
- d) Why is it important to consider factors like long term human memory and/or short term human memory when designing typical software applications? List and explain any **THREE** reasons. (5)

(Total: 20 marks)

Answer any TWO questions A2, A3 and A4.

Question A2

- a) Convert the following values:
23210 to binary;
16A to decimal. (4)
- b) Write down the number 982.101 in normalised form. (2)
- c) Data is being stored on a hard disk or sent over a network. What type of low level check can be used to detect changes to the data blocks? (4)
- e) Why is it important for an organisation to filter out the information that it obtains or stores? Give **TWO** valid reasons. (4)
- f) Give **ONE** technological and **ONE** legislative reason why information is becoming increasingly difficult to handle in modern organisations. (2)
- g) Large volumes of confidential user data is sent over a network. What changes have to be done to the data when it is sent over a network in order to secure it? (4)

(Total: 20 marks)

Question A3

This question is about IS in organisations.

- a) Give any **FOUR** reasons for unsuccessful implementation of IT systems. Briefly explain. (4)
- b) In a large computer database only a small part of the information is updated regularly. Explain if the entire database should be backed up. (2)
- c) A manager requires a drill-down to find which outlets have the most sales. Describe a possible type of system that would do this. (2)
- d) List and explain any **FOUR** major tasks related to project management. (4)
- e) What action has to be taken if a software project deviates from its scheduled date? (4)
- f) What are any **FOUR** main qualities that a good and successful software development team should have? (4)

(Total: 20 marks)

Question A4

- a) List any **THREE** groups in an organisation that have different training requirements. Briefly explain the needs of each group. (6)
- b) A company requires a training plan that will cover all its IT systems. Briefly explain. (4)
- c) In a business organisation when is a peer-to-peer network preferred over a server based network? (2)
- d) An application that runs over the network requires a fast rate of data transfer. Explain whether broadband or narrowband should be used. (4)
- e) In a large organisation give **TWO** uses for each of the following: i) bridge and ii) gateway. (4)

(Total: 20 marks)

SECTION B: Human Communication and Business Organisations

Answer the first question in this section and any other TWO questions.

SECTION B: HUMAN COMMUNICATIONS & BUSINESS ORGANISATION

Question B1

This question is compulsory. Answer all parts.

- a) Which functional area of an organisation is responsible for:
 - i. ordering raw material;
 - ii. promoting a new product;
 - iii. employee performance appraisal;
 - iv. manufacturing finished goods;
 - v. issuing Profit & Loss and Balance Sheet statements. (2.5)
- b) What type of organisation are the following:
 - i. Lloyds's Bank plc;
 - ii. Vistaprint Ltd.;
 - iii. John Smith & Paul Brown Plumbers;
 - iv. Council for Science and Technology;
 - v. John White. (2.5)
- c) List any **THREE** disadvantages of an e-business solution that is adopted in a modern organisation. Give any **TWO** possible solutions to these issues. (5)
- d) List and explain any **TWO** reasons why a modern organisation requires to have an information security policy. (2)
- e) What is a data subject? Explain any **TWO** rights of the data subject. (3)

(Total: 15 marks)

Questions continue on next page

Answer any TWO questions from B2, B3 and B4

Question B2

An organisation is in the process of implementing a new Information System. Describe **FIVE** factors that the organisation needs to manage in order to ensure a successful implementation. Briefly explain what type of resistance can arise from the employees as regards this new information system. What measures can be taken to address this problem.

(Total: 15 marks)

Question B3

"The information society is a society where the creation, distribution, use, integration and manipulation of information results in significant diverse activity." Explain what is meant by this statement. Briefly explain how new technologies, software and policies contribute to creating an information society.

(Total: 15 marks)

Question B4

Strategy is very important for the successful outcomes of Business Organisations. Strategy is also IT driven. Explain what is meant by IT strategy. Briefly describe how IT strategies can be used by an organisation to derive a competitive advantage. Give **FIVE** examples.

(Total: 15 marks)



SUBJECT:	Information Technology
PAPER NUMBER:	II
DATE:	4 th September 2018
TIME:	9:00 a.m. to 12:05 p.m.

Directions to Candidates

A total of **SIX** questions must be attempted; **THREE** from Section A and another **THREE** from Section B.

SECTION A: SOFTWARE

Answer the first question in this section and any other TWO questions.

Question A1

This question is compulsory. Answer all parts.

- a) Define **THREE** different types of malware. (3)
- b) Explain any **THREE** differences between a compiler and a translator. (3)
- c) What protocol is used when sending an email? Give a definition of this protocol. (3)
- d) What is the main function of the memory manager within the Operating System (OS)? (2)
- e) Operating systems usually include a number of system software applications.
 - i. Give a definition of system software. (1)
 - ii. Give **THREE** examples of system software applications. (3)

(Total: 15 marks)

Answer any TWO questions A2, A3 and A4.

Question A2

This question is about Internet related software.

- a) More modern forms of content sharing such as Facebook and Twitter have diminished the use of RSS. What is RSS and how can it still be used efficiently? (3)
- b) Give **THREE** possible uses for CSS. (3)
- c) Explain the purpose for Internet registries. (2)
- d) You have been developing websites for clients for the past few years. A new client would like to present a form to be filled in by the user. How can we make sure that the data provided by the user is valid? (3)
- e) Malware and Internet based fraud are becoming real issues that affect thousands of people worldwide. Mention and explain **TWO** solutions that can be employed to try and solve these critical problems. (4)

(Total: 15 marks)

Question A3

This question is about Databases

- a) How can security be implemented in database systems that contain confidential data? (1)
 - b) Explain the importance of having a database administrator for a large database system. (2)
 - c) What is the purpose of the file manager within a DBMS? (2)
 - d) Why does duplication of data cause big problems in a database system? (2)
 - e) Mention and explain **FOUR** fundamental issues that need to be considered when designing a database. (4)
 - f) Explain using examples **TWO** different possible cardinalities in relational databases. (4)
- (Total: 15 marks)**

Question A4

This question is about Software

- a) Give **TWO** advantages why a software development house should make use of application generators when developing large systems. (2)
 - b) Give an explanation of the following terms as related to Operating Systems:
 - i. multitasking;
 - ii. multiprogramming;
 - iii. GUI. (3)
 - c) Explain the significance of reliability tests for certain classes of software applications. (2)
 - d) Mention and explain **THREE** major components of an Operating System excluding application generators. (3)
 - e) You have been asked to write a software evaluation report on a particular business system software application. Mention and explain **FIVE** criteria that you would include in your report. The report is to be presented to management. (5)
- (Total: 15 marks)**

SECTION B: PROGRAMMING TECHNIQUES AND SYSTEM DEVELOPMENT

Answer the first question in this section and any other TWO questions.

Question B1

This question is compulsory. Answer all parts.

Figure 1 below shows a program snippet in Java:

```

1 public class NumberOperations
2 {
3     public static void main(String[] args)
4     {
5
6         int One = 20;
7         int Two = 30;
8
9         int Total = One + Two;
10        int Average = Total / 2;
11
12        System.out.println("The total is " + Total);
13        System.out.println("The average is " + Average);
14
15    }
16 }
```

Figure 1 - Java Code

- a) Answer the following questions with regard to the code shown above.
- i. What is the output of the code? (1)
 - ii. Modify the code in Figure 1 so that the application calculates the total and the average of **THREE** numbers. (2)
 - iii. Add code to what is shown in Figure 1 so that the application also works out and shows the multiplication of the two numbers. (2)
 - iv. Modify the code shown in Figure 1 so that integers `One` and `Two` are filled in from data from the keyboard. (5)
- b) A table in a shop database has the following schema:
PRODUCT (ProductCode, ProductName, SupplierCode, Price, Discontinued)
- i. Write an SQL statement to output the ProductName, SupplierCode and the Price for all products where the price is over 50. (3)
 - ii. From the schema above, which field would you choose as your primary key. Give **ONE** reason for your answer. (2)

Question continues on next page

c) Figure 2 below shows an HTML code snippet:

```
1 <html>
2     <head>
3         <title> September 2018 </title>
4     </head>
5     <body>
6         <h1> This is HTML code </h1>
7         <p> This is an exercise for MATSEC EXAMINATIONS</p>
8         <a href=http://www.google.com></a>
9     </body>
10 </html>
```

Figure 2 - HTML Code

- i. Explain line by line what the above code snippet does. (5)
(Total: 20 marks)

Question B2

This question is about Programming Techniques

- a) Define and give an example of the following in the Java programming language:
i. Reserved word;
ii. Identifier. (4)
- b) List **TWO** advantages of using structured programming techniques. (2)
- c) Give TWO situations when it is better to use object oriented programming. (2)
- d) A class called Client requires three attributes: one string called FullName, one integer called Weight and another integer called Age.
i. Write a default constructor that sets the FullName to Marvin Smith, the Weight to 67 and the Age to 18. (4)
ii. Write a custom constructor that sets the attributes according to the value set in the input parameters. (4)
- e) Give an example of code in Java that includes a syntax error. (2)
- f) Give an example of code in Java that includes a run-time error. (2)

(Total: 20 marks)

Question B3

This question is about System Development

- a) What is the purpose of a DFD? (2)
- b) Mention and define the **THREE** main aspects that should be considered when evaluating systems. (3)
- c) Create a DFD for the following online shop: (5)

The customer sends the order form. An 'Out of Stock' email is sent if the items ordered are not in stock. If the desired items are in stock, the order details are entered in the database and a bill is issued to the customer.
- d) What should a feasibility study for a new IT accounting system consist of? (5)
- e) How can planning for a new IT system be supported? Briefly explain. (5)

(Total: 20 marks)

Question B4

This question is about Software and Web Design.

- a) A software development house has developers using different high-level programming languages.
 - i. What is a high-level programming language? (2)
 - ii. Joseph is using a programming language called PHP. A PHP application is translated one statement at a time and stops execution when the first error is met. What type of language is PHP? (1)
 - iii. Maria is making use of Haskell, which is a functional programming language. Mention **ONE** characteristic and **ONE** area of application for functional languages. (2)
 - iv. What is **ONE** difference between a high-level programming language and assembly language? (1)
 - v. Why are methods used in JAVA? (1)
 - vi. Why is it not possible to use a reserved word as a variable in a programming language? (1)
- b) DFDs and UML Class diagrams are useful for designing systems.
 - i. Explain any **TWO** possible differences between UML Class diagrams and DFDs when designing a system. (2)
 - ii. Should a Class Diagram or a Use Case Diagram be used when modelling the main function of a system? Briefly explain. (4)
- c) Why are system and information requirements necessary during system development for the successful implementation of software applications? Expand your answer by providing **FIVE** criteria that have to be considered at this stage. (6)

(Total: 20 marks)