



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

(Successor to the Institute of Computer Technology (ICT), University of Colombo)

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2003/2004 – 2nd Year Examination – Semester 4

IT4301: Professional Issues in IT

PART 2 –Structured Question Paper

31st July, 2004

TWO HOURS

To be completed by the candidate

BIT Examination Index No: _____

Important Instructions:

- The duration of the paper is 2 **(two) hours**.
- The medium of instruction and questions is English.
- The paper has **6 questions** and **16 pages**.
- **Answer questions 1 and 2 which are compulsory (30% marks each) and any two of the other questions (20% marks each) and no more.**
- **Write your answers** in English using the space provided **in this question paper**.
- Do not tear off any part of this answer book.
- Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.
- Note that questions appear on both sides of the paper.
If a page is not printed, please inform the supervisor immediately.

Questions Answered

Indicate by a cross (X), (e.g. ☐) the numbers of the two questions answered.

To be completed by the candidate by marking a cross (x).	Question numbers					
	1	2	3	4	5	6
To be completed by the examiners:						

Question No.1 is based on the following CASE STUDY I.

Nimal is a Senior Software Engineer at a State Corporation and his superior officer is Sarath, the IT Manager. Nimal is a graduate in Computer Science from the University of Colombo and is also a member of the British Computer Society. Sarath has no formal qualifications in Computing but has been an executive at the State Corporation for the last 20 years. He has a good working knowledge of the affairs of the Corporation and has been the IT Manager since the inception of the IT division fifteen years ago. Further, Sarath is not a member of any Computer Society but is the President of the Executive Officers' Union. Nimal has several programmers under him and is responsible for the smooth operation of the computer system of the Corporation where information on personnel, financial transactions, salaries, provident funds, stocks etc. are stored and processed. The IT Manager however is in overall control and reports to the Chief Executive Officer. Being a state Corporation, the Chief Executive Officer is answerable to the Ministry Secretary and the Minister himself.

The Minister was keen on launching a website for his Ministry and entrusted it to Sarath who in turn requested Nimal to use his staff to create same. Nimal selected one of his competent staff members, Manjula to design a prototype to be demonstrated to the Minister. Manjula then met with Sarath to find out the requirements of the site and was told to meet the Ministry Secretary bypassing the Chief Executive Officer.

Manjula spent most of his time in developing the website and was not able to devote much time to his normal work. Due to this, the reports which normally had to be submitted to the Chief Executive Officer were delayed resulting in loss of revenue. The Chief Executive Officer called for explanations from both Sarath and Nimal. Owing to this, Manjula was also deprived of attending a seminar for which he was nominated by Nimal.

When the prototype of the website was shown to the Minister, he directed Sarath to arrange for an official launch after hosting the site at the Corporation and to provide public access to information on the Corporation through the site via the internet. The Corporation was directed to meet all costs. Sarath was also directed to create a post of webmaster and appoint Manjula to the post which would be directly under Sarath in addition to his normal duties under Nimal.

When purchasing the necessary equipment, software and services, approval of the Chief Executive Officer was needed but he refused to give approval. In view of the urgency and importance of fulfilling the Minister's request, Sarath requested Nimal to use Corporation resources to a minimum and launch the site. The only funds available were earmarked for security measures and Nimal decided to fund the requirements from Corporation resources by diverting the funds meant for the purchase of anti virus software and other urgent security requirements.

At the launch, when the Minister inaugurated the website by clicking on the icon, the home page appeared but was soon replaced by a derogatory statement that flashed across the screen. This ugly incident resulted in the dignitaries present being embarrassed and the management furious.

Question 1 (COMPULSORY) (30 marks)

- 1) (a) How does the attitude of Nimal differ from that of Sarath with respect to professional issues?

(04 marks)

ANSWER IN THIS BOX

Nimal as a member of the BCS has to adhere to the code of conduct and code of ethics of the BCS while there is no such requirement enforced on Sarath even though he has been in the IT profession for a long time. On the other

Continued..

hand, as the President of the Executive Officers' Union, he has to perform some functions which are of the nature of a trade union. Also as the IT manager, he is answerable to the management including the minister.

- (b) How should Sarath and Nimal respond to the explanations called for by the Chief Executive?

(06 marks)

ANSWER IN THIS BOX

Nimal as a computer professional has to see to the welfare of Manjula and also to his receiving further training. Thus, he should not have been happy when he lost a training opportunity for Manjula due to reasons beyond him. The fact that the required time for Manjula's assignment was not properly allocated is also an aspect which a professional would not like. Thus, Nimal should defend Manjula and find fault with the way the additional assignment was undertaken and given to Manjula.

Sarath on the other hand, as the IT manager, should take responsibility and say so to the CEO. He should also have indicated how best the work on the web site should have been undertaken without disrupting the normal work of the organization.

- (c) What steps should Nimal take regarding the selection of information to be released to the public through the web site?

(04 marks)

ANSWER IN THIS BOX

As the web site would not be protected adequately, he should see to it that the information provided could only be in a read only format to prevent alterations. Confidential information should never be included.

- (d) If Sarath requests Nimal to install pirated anti virus software, what should be his reaction?

(03 marks)

ANSWER IN THIS BOX

Nimal as a professional would not break IPR laws. On the other hand, he would want to protect the site. As such he would use a trial version of anti virus software and work towards obtaining funds or use the best available free anti virus software to minimize the threat.

- (e) Is Manjula having a conflict of interests in his duties?

(03 marks)

ANSWER IN THIS BOX

Yes. When working on the web site he had to by pass the CEO and take instructions from the Ministry Secretary.

- (f) Explain in detail what measures should have been taken by each of the following, Manjula, Nimal, Sarath, Chief Executive Officer and the Secretary, to prevent such an ugly incident.

(10 marks)

ANSWER IN THIS BOX

a. Manjula

He should have obtained permission from his CEO through the IT

Manager before undertaking the work and also should have indicated that he needs time off his normal work.

b. Nimal

He as a professional should have taken steps to safeguard the interests of his subordinate and should have advised him.

c. Sarath

He should have kept the CEO informed. He should have also indicated the difficulties which would arise.

d. Chief Executive

He did not know about this and therefore could not have done much.

e. The Secretary

He should have anticipated internal problems in asking Manjula to help as he was by- passing the administrative structure of the organization.

CASE STUDY II Question 2 (COMPULSORY) (30 marks)

- 2) Based on the following case study II, answer the questions which follows.

Kamal, a professional software engineer, is a free lance consultant for many software companies. His personal computer has two operating systems. One is a Linux operating system which he installed himself and the other is Microsoft Advanced Server which was already installed by the supplier when he purchased the machine. This operating system has not been licensed either by him or the vendor. He noticed that in addition to the operating system, Microsoft Office was also available in his machine.

Since he does not have any licensed tools to create presentation slides, he uses Microsoft Power Point to create such slides about a new project, for a presentation for the top level management of ABC (Private) Ltd., a leading software development company.

The Board of Directors of the company fully satisfied with him, had asked the company legal officers to draft the necessary documents to carry on with the project.

The CIO proposed that if the company uses open source software, it can get certain advantages. One of the developers in this company, Shantha, noticed that an open source compiler is available under GNU GPL license, which has been obtained under license and modified to suit their requirement. Later, they realized that there is a heavy demand for the modified compiler. As similar proprietary software available in the market was very expensive, they decided to sell the object code at a competitive price. If some one wanted to obtain the source code as well he was asked to pay more.

Sarath, another developer, went through the GNU GPL license and gave, for academic purposes, the same modified version of the compiler and other proprietary tools belonging to the company to one of his friends studying at a university.

The company creates video conferencing units using a small digital camera which was patented in USA. In addition to the camera, this unit contains an electronic circuit, a computer chip where the compiler is embedded and a web based interface. A user can write small programs using the web interface and compile the code. In developing the web based interface, Apache modules under Apache Software License have been used.

- (a) If the company obtains the compiler under GNU GPL license, does the company have the following rights?

- (i) To modify the compiler

(03 marks)

ANSWER IN THIS BOX

Yes. GNU GPL license allows one to modify the programme to form a new work.

- (ii) To charge royalty for the modified programme

(03 marks)

ANSWER IN THIS BOX

No, it should be distributed free of charge.

- (iii) To prevent giving the source code of the modified programme

(03 marks)

ANSWER IN THIS BOX

No, under the above license agreement, no one can prevent giving the source code of the modified programme when it is distributed.

- (iv) To charge a fee for the cost of the CD which contains the programme?

(03 marks)

ANSWER IN THIS BOX

Yes, the company can charge a nominal amount for the physical transfer of the programme in to the CD.

- (b) Can Sarath copy and distribute the compiler to his friend?

(04 marks)

ANSWER IN THIS BOX

Yes, under this license agreement, there is no restriction in copying and distributing. However it might be restricted according to the contract between the company and the employee.

- (c) Can Sarath copy and distribute the other proprietary software to his friend?

(05 marks)

ANSWER IN THIS BOX

No, he cannot do so since that would violate copyright protection of the owner. Copying and distributing of a proprietary software can be done by the copyright owner or any person with authority from the owner.

- (d) Can Kamal, under the copyright law, protect his presentation which was prepared using unlicensed software on an unlicensed operating system?

(04 marks)

ANSWER IN THIS BOX

Yes. If his presentation is original in nature, he can protect his presentation since it comes under literary work. The technology used to develop the presentation is not an issues in protecting his work.

- (e) Can this video conferencing unit be copyrighted/ patented? Justify your answer.

(05 marks)

ANSWER IN THIS BOX

If it involves inventive steps, industrially applicable and new, it can be protected as patented work. The electronic circuit, and software embedded in the chip can be protected as patented work.

3) **Question 3 (OPTIONAL) (20 marks)**

You as the Chief Information Officer (CIO) of a large company with over 100 computer professionals under you, are requested by your Chief Executive Officer (CEO) to draft a code of conduct for the computer professionals employed by the company taking such codes as a guide as are available for professional bodies.

- (i) Indicate below the major components of such a code describing why such components are included and the benefits of each such component to the company and to society.
- (ii) Would the employees of the company who follow such a code be eligible to be members of the Computer Society of Sri Lanka? Explain giving reasons.

(20 marks)

ANSWER IN THIS BOX

(i)

Major components of the code of conduct and why they are included

- a) public interest
The IT professional has a responsibility towards the public
- b) integrity
This is a major requirement of any professional as this would ensure impartial and responsible conduct
- c) confidentiality
The professional is expected to maintain confidentiality of what he comes to be aware of from others in the company and from clients during the course of his work as this too is essential
- d) objectivity
A professional is expected to be focused on his responsibilities
- e) competence
A professional should be competent in his work as this is much needed for him to properly serve his employer and clients
- f) keeping up to date
A professional is expected to be efficient and complete his assignments on time.
- g) assisting subordinates
Helping his subordinates to acquire further knowledge, gain experiences etc are all responsibilities of a professional as this would help maintain the high standards of the profession
- h) responsibility to client
A professional has to perform his duties well and this includes being responsible to his clients and not merely to his employer.
- i) promoting IT
The IT professional should contribute towards promoting IT as he is collectively responsible for the well being of IT as a whole
- j) image of the profession
There is a need to have a good image of the profession among the public as this would help enhance the recognition of the profession

Benefits of each to company

- a) The company too will be recognized by the public
- b) The recognition of the company by clients would be enhanced
- c) The recognition of the company by clients would be enhanced
- d) The company will benefit from the performance of the professional
- e) The company will benefit from the performance of the professional
- f) The company will benefit from the performance of the professional
- g) The improved competence and performance of the subordinates will help the company to provide a better service
- h) The company will benefit from the performance of the professional
- i) The company will also gain from the overall promotion of IT
- j) By employing professionals who have a good image, the company too will have a reputation

(ii)

Benefits of each to society
public interest shown by the professional would undoubtedly benefit society
society will benefit from all these aspects of the conduct of the professional, as they will result in more efficient performance and an improved profession.

This would be conditional on each employee having the specified
qualifications and experience as required by the rules of the CSSL.

Once a member, the employee will have to follow the code of
conduct of the CSSL which would be very similar.

Continued..

4) **Question 4 (OPTIONAL) (20 marks)****Part A (10 Marks)**

- (a) Indicate four types of computer misuse giving a comprehensive explanation of each with examples.

(02 marks)**ANSWER IN THIS BOX**

1. **Hacking – Unauthorised access to computers. Someone is able to physically break into a room and read data from paper records, however, it is sometimes more difficult to trace someone who has broken into a computer over a network or the Internet. The hacker is able to do this from their own room or even from another country entirely**
2. **Unauthorised copying of content stored in a computer**
It is very easy to make copies of computer data without leaving a trace that it has been done. A photocopier will also make copies of paper-based data. However, electronic copies of data can be smuggled out easily on floppy disks, memory chips or over a network connection
3. **Introduction of Malicious (harmful) programs to a computer that can damage the data stored on it. Eg: Viruses**
4. **Unauthorised modification of computer material to impair the operation of any computer, or to prevent or hinder access to any program or data held in any computer or to impair the operation of any such program or the reliability of any such data.**

- (b) Explain in detail the role of a computer professional with respect to

- (i) Society at large

(02 marks)**ANSWER IN THIS BOX**

They should not use their skills and knowledge for anti-social and destructive activities. The most notorious are hackers and Virus developers. A professional code of conduct requires its members to maintain standards, which are for the public good. A professional should use his knowledge and skill to protect the safety & well being of the public.

Should have regard for human rights, have knowledge of relevant legislation and have regard for the legitimate rights of third parties.

The public expects the IT professional to be socially responsible and disciplined and should be a role model for the youth.

You must use your knowledge & skill in a responsible and humane manner to bring about a positive change in society.

(ii) The IT profession

(02 marks)

ANSWER IN THIS BOX

Members should uphold the reputation of the profession
 Should conform to the code of conduct and practice of the professional body
 Should seek to upgrade their professional knowledge & skill
 Should undertake work or provide services, which are only within their professional competence
 They shall accept responsibility for their work and the work of subordinates
 They shall avoid any situation that gives rise to conflicts of interest

(iii) The IT industry

(02 marks)

ANSWER IN THIS BOX

They must be aware of the following facts:

- Computing Business Ethics
- Professional Institutions in the Computing Industry
- Codes of Conduct and Practice in the Computing Industry
- Computing Industry Related Law
- Intellectual Property: Copyright, Designs, Trademarks and Patents.

IT professionals must face the issue of currency. Professionals must find ways of staying current on IT and IT related issues. This requires continuous self-development on the part of the IT professional. Simply because you are certified, or you have many years of experience, does not mean you should go to sleep. The IT field is one of the fastest developing fields worldwide. You cannot afford to be outdated or allow your skills to stagnate. As an IT professional, you cannot be relevant to the Industry if you are not current. As a professional, you must have the ability and desire to update yourself on a continuous basis. They shall avoid any situation that gives rise to conflicts of interest.

(iv) National IT policies

(02 marks)

ANSWER IN THIS BOX

As members of the IT profession, members have to advise on many of the important IT related issues, inform and influence individuals, organizations and government, and through the work of its members must make world class expertise available in most areas of IT competence.

Part B (10 marks)

A list of ten key words is given in Column I on the left hand side and relevant meanings, also ten in number, are given in Column III on the right hand side. Match each keyword to the appropriate meaning in Column III and write down the corresponding Roman numeral in column II. Each key word may have more than one meaning but, each box of column II should contain only one Roman numeral and no two such boxes should contain the same numeral. Marks would be deducted for incorrect matching.

(10 marks)

I	II	III
1. Cyber Forensics	(iv)	(i) An account held in trust or as security until the occurrence of a certain condition
2. Asymmetric key crypto system	(viii)	(ii) This is a common law tort. It occurs when misrepresentations made by a defendant damages the goodwill of a plaintiff.
3. Unfair competition	(x)	(iii) Can be copyrighted if this is original by virtue of the selection and arrangement
4. Undisclosed information	(ix)	(iv) Preservation, identification, extraction, documentation and interpretation of computer media for evidentiary and/or root cause analysis using well-defined methodologies and procedures
5. Passing off	(ii)	(v) This recognizes the rights of those who present literary and artistic works to the public.
6. Database	(iii)	(vi) Prohibits collection of personal information of a particular class of persons in society
7. Related rights	(v)	(vii) Crime committed using a computer and the internet to steal a person's identity or sell contraband or stalk victims or disrupt operations with malevolent programs
8. ESCROW	(i)	(viii) A cryptographic system having a secure key pair consisting of a private key for creating a digital signature and a public key to verify the digital signature
9. Children online protection act	(vi)	(ix) This protects secret information which has monetary value.
10. Cyber Crime	(vii)	(x) An act, which is contrary to honest practices in commerce and industry

5) **Question 5 (OPTIONAL) (20 marks)**

(a) What objectives can a code of professional conduct serve?

(08 marks)

ANSWER IN THIS BOX

Continued.

It serves as a statement representing the experience and consensus of many members of the profession.
It helps to establish public trust.
It informs employers, clients and the public of what to expect in their dealings with the members of the profession.
Code can serve as a statement of rules or standards to be maintained by the members of the profession.
Code can sensitize members to issues which they may not be aware of.
Code can provide guidance to a member when in tough ethical situations.
Code can be used as a means of educating new members as to what the expected standards in the profession are.

- (b) Discuss the benefits and drawbacks of the three important characteristics of Internet namely,
- (i) Providing many-to-many communication on a global scale,
 - (ii) Facilitating a kind of anonymity and
 - (iii) Allowing reproducibility.

(12 marks)

<u>ANSWER IN THIS BOX</u>
(i) Providing many-to-many communication on a global scale:
<u>Benefits</u>
Brings people together, makes geographic space and distance less important, gives individuals access to huge quantities of diverse information, facilitates communication
<u>Drawbacks</u>
Power also goes to those who will use it for heinous purposes such as disruption, stealing, snooping, harassing, stalking etc.

Continued..

(ii) Facilitating a kind of anonymity:**Benefits**

Individuals have the advantage of not being seen. In contexts in which race, gender or physical appearance may get in the way of fair treatment, anonymity will serve as an equalizer.

Anonymity may also facilitate participation in certain activities where individuals may otherwise be reluctant.

In formal situations such as in the workplace, individuals may think more creatively and provide better feedback when they have the shroud of anonymity.

Drawbacks

Create serious problems for accountability and for the integrity of information.

(iii) Allowing reproducibility**Benefits**

Facilitates global reach

Drawbacks

Violation of privacy and property rights

Question 6 (OPTIONAL) (20 marks)

- 6) (a) What are the means of accepting on-line contracts?

(04 marks)**ANSWER IN THIS BOX**

email Or any other form of electronic message

Clicking on a button

Downloading content

Entering a symbol or code

- (b) Comment on the statement below.

“The university authority does have rights to monitor and read email messages of the staff and students”

(04 marks)**ANSWER IN THIS BOX**

The university authority does have rights to monitor and read email messages of its staff and students since those facilities are given for their academic and research work and not for their personal purposes.

If an email is purely of a personal nature, the authority should refrain from continuing to read it but it is not a legal requirement.

- (c) “Fair use” is not an infringement of copyright law. Comment on the statement

(04 marks)**ANSWER IN THIS BOX***Continued..*

Yes, according to section 11 of The Intellectual Property Act No.36 OF 2003, certain acts are not considered as infringements of the law. The following activities come under the fair use doctrine.

- **Reproduction in copies or by any other means for purposes such as criticism, comment, news reporting, teaching, scholarship or research**

- (d) Saman creates a web page with popular Sri Lankan scenery. Since he does not have any original pictures, he creates links to other web sites which contain very beautiful scenery. He argues that, his act is not an infringement since he has not copied anything but is simply making links to other web sites where the viewer downloads the pictures from other sites. Comment on his statement

(08 marks)

ANSWER IN THIS BOX

Even though he has not directly copied images from another web site, he indirectly compels all visitors to his web site, to download images from another web site and attempts to pass off others' work as his own work which comes under the reverse of passing off (work of someone else is passed off as one's own).

Copyright law provides that one who knowingly makes an infringement possible can himself be held liable under a theory of contributory infringement.

Not only that, he can also be charged for indulging in unfair competition since he passes off others' work as his own work.
