Department of Higher Education
University of Computer studies, Hinthada
Fourth Year (B.C.Sc/B.C.Tech)
Final Examination
English
September, 2018

Answer All Questions **Time allowed: 3 Hours**

QUESTION I **(20 marks)**

I. Read the following passage and answer Questions 1-10.

STUDENT ACCOMODATION AT NORTHSIDE UNIVERSITY

Situated about 20m from the city centre, Northside University is not easy to get to by public transport. However, students have several different alternatives for accommodation on or near the University campus.

Firstly, the University has several residential colleges; Burnside College, Boronia College and Helen Turner College. Each of these colleges provides a single fully furnished room with shared bathroom facilities, and meals. Burnside College is the most expensive, with 1996 fees ranging from $ 154 - $ 165 per week. However, each student room is equipped with a private telephone and voice-mailing facilities, and within the next few months, college students will have access to E-MAIL, On-Line library, INTERNET and AARNET via a network with the University. Boronia College has similar room facilities but does not offer the same computer access. It also offers only 17 meals per week, compared to Burnside's 21. Fees vary from $ 147 - $157 per week. Helen Turner College is a college exclusively for women, with similar fees to Boronia College. To attend classes, students have a short walk from the residential colleges to the main University campus.

The University also provides 23 self-contained furnished townhouses. These townhouses have either 3, 4 or 6 bedrooms each and student residents are expected to be studying full-time. Rents in 1996 ranged from $ 54 per week for a room in a six bedroom flat to $68.50 per week for a room in a three-bedroom house. Students wanting to live in university housing should apply to the university housing officer in August of the previous year, as it is in high demand. Smoking is banned in University housing.

Off campus, there are many flats, townhouses and houses for rent in the local area. These can be found by looking in the local newspaper under ACCOMODATION, or by checking notices pinned up on the boards around the university. There are always students advertising for housemates and you can even add a notice of your town to the board. However, even sharing accommodation with others can be expensive; tenants are usually required to pay a rent bond, rent in advance, and

telephone/ electricity/ gas bills in addition to food bills. Be sure that you know what you will be required to pay before you enter into any written agreement.

Questions 1-4

Choose the appropriate letter A-C for the following sentences.

1. The University Residential Colleges provide
   - A. a place to live and regular classes
   - B. regular classes only
   - C. a place to live only
2. Smoking is
   - A. allowed in University housing
   - B. not allowed in University housing
   - C. allowed only in certain area in University housing
3. University town houses are available for
   - A. full-time students only
   - B. part-time students only
   - C. all students
4. Accommodation in the area surrounding the university is
   - A. scare
   - B. plentiful
   - C. scare and expensive

Questions 5-10

Complete the following sentences with ***information from the passage***.

A student living in a 3-bedroom University townhouse would pay (5) _____ per week for a room; in comparison, the cheapest accommodation available at Burnside College is (6) _____ per week. The fee charged at Burnside College includes (7) _____ meals per week, but at Boronia College only (8) _____ meals per week are included in the fee. Helen Turner College has a similar fee structure to (9) _____ College, but only (10) _____ may live there.

QUESTION II **(20 marks)**

II. (A) Complete each sentence using the information in brackets.

1. (The rent is high.) The bigger a flat is, ----------.
2. (The roads are quiet.) The earlier you leave, ----------.
3. (you will be successful.) The harder you try, ----------.
4. (I am tired.) The more I work, ----------.
5. (He becomes impatient.) The older he grows, ----------.

II. (B) Fill in the correct form of the words in brackets.

1. She has always been (efficient) of all my secretaries.

2. It was (old) one we visited during our holidays.

3. Could you write (clear)?

4. Mike played (good) than any other players on the team.

5. Yesterday, I fell asleep (early) than today.

II. (C) Join the two sentences to make one sentence using a noun phrase. Add prepositions where necessary.

1. I live in Naypyidaw. I live in the capital city.

2. Youth depend on electronic devices. The number is increasing.

3. The television was stolen. The television was bought twenty years ago.

4. I have a decision. It is to build a new software.

5. A new dictionary is about to be published. The dictionary contains more words than ever before.

QUESTION III

(20 marks)

III. Complete the gaps in the following paragraph using the words in the box.

these	limited	use	taxonomist	simple
them	area	as	include	several
all	range	on	classification	allow
is	likely	the	possible	thus

Collecting ants can be as ---(1)--- as picking up stray ones and placing ---(2)--- in a glass jar, or as complicated ---(3)--- completing an exhaustive survey of all species present in an ---(4)--- and estimating their relative abundances. The exact method used will depend ---(5)--- the final purpose of the collections. For taxonomy, or ---(6)---, long series, from a single nest, which contain ---(7)--- castes (workers, including majors and minors, and, if present, queens and males) are desirable, to ---(8)--- the determination of variation within species.

For ecological studies, the most important factor ---(9)--- collecting identifiable samples of as many of the different species present as ---(10)---. Unfortunately, ---(11)--- methods are not always compatible. The ---(12)--- sometimes overlooks whole species in favor of those groups currently under study, while ---(13)--- ecologist often collects only a ---(14)--- number of specimens of each species, ---(15)--- reducing their value for taxonomic investigations. To collect as wide a --- (16)--- of species as possible, ---(17)--- methods must be used. These ---(18)--- hand collecting, using baits to attract the ants, ground litter sampling, and the ---(19)--- of pitfall traps. Hand collecting consists of searching for ants everywhere they are ---(20)--- to occur.

QUESTION IV

(20 marks)

IV. (A) Answer the following questions.

1. Why are you interested in your specialization subject?

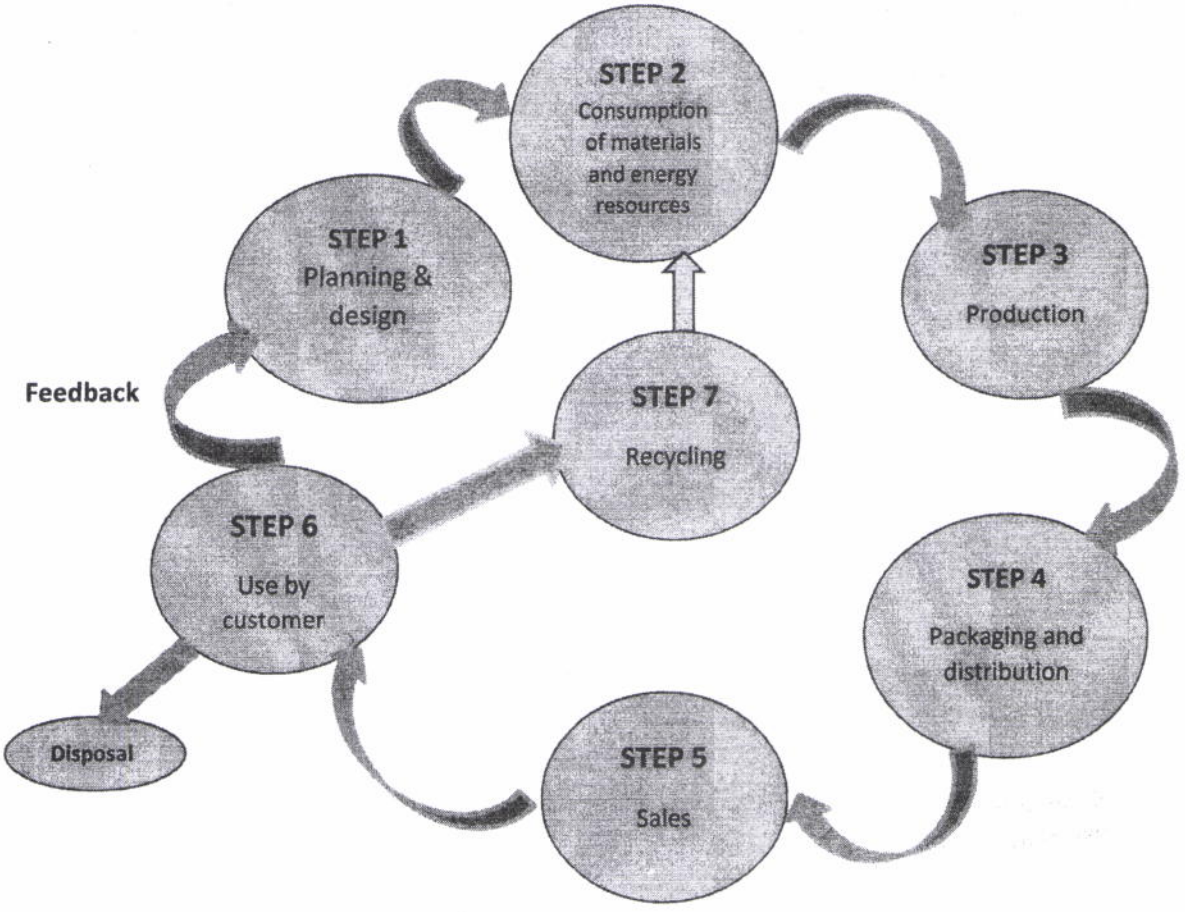
2. What do you do after a bachelor's degree? Why?

3. What do you have personal knowledge about your specialization subject?

4. What skills do you need to be a good programmer?

5. Do you think your English skill is important in your career? Why?

IV. (B) ***The diagram below shows the environmental issues raised by a product over its lifecycle.*** Summarise the information by selecting and reporting the main features, and make comparisons where relevant. (Write at least **150** words.)



QUESTION V **(20 marks)**

V. Write the following topic:

Some people think that cities are the best places to live. Others prefer to live in a rural area. Compare the advantages and disadvantages of living in the city to living in the countryside.

Give reasons for your answer and include any relevant examples from your own experience.

(Write at least **250** words.)

---------- *End Of Questions* ----------

Department of Higher Education
University of Computer Studies,Hinthada
Fourth Year (B.C.Sc.)
Final Examination
Digital-Business and E-commerce Management (CS-401)
September,2018

Answer All Questions **Time Allowed: 3 Hours**

1.Choose the correct answer for the following. For each choice, write (A), (B), (C) or (D) only. **(15 marks)**

(i) E-commerce is often seen as simply buying and selling using the internet but do the following perspectives also apply to e-commerce?
- (A) A communications perspectives
- (B) A business process perspectives
- (C) An online perspectives
- (D) All of the above

(ii) E-business actually stands for
- (A) an organization using electronic media to purchase from to its suppliers
- (B) An organization using electronic media to sell direct to its customers
- (C) Any electronically mediated communication between an organization and its stakeholders
- (D) electronic business

(iii)A key marketing technique involves paid placements or sponsored links using PPC. What does PPC stand for?
- (A) Pay per click
- (B) Pay per consumer
- (C) Personal protocol choice
- (D) Public promotion click

(iv)Microsoft Internet Explorer, Mozilla Firefox, Apple Safari, and Google Chrome examples of?
- (A) Web servers
- (B) Web browsers
- (C) Web application servers
- (D) All of the above

(v) Which one of the following terms refers to 'cutting out the middleman'?
- (A) Countermediation
- (B) Reintermediation
- (C) Disintermediation
- (D) None of the above

(vi) When considering strategy, the matching of internal resources against external demands forms part of:
- (A) strategic analysis
- (B) strategic implementation
- (C) strategic objectives
- (D) strategic definition

(vii) The coordination of all supply activities of an organization from its suppliers and partners to customers if referred to as

(A) efficient customer
(B) supply and demand coordination
(C) supply chain management
(D) supply chain network

(viii) A breakdown of customer according to different characteristics. This approach is known as :

(A) Psychographics segmentation
(B) Webographics
(C) Online buyer behaviors
(D) None of above

(ix) The terms 'purchasing' and 'procurement' are often used synonymously but which of the following statements provides a more refined distinction?

(A) Purchasing has a broader meaning than procurement
(B) Procurement has a broader meaning than purchasing
(C) Procurement is broadly equivalent to purchasing
(D) None of the above

(x) In future, some suggest that the task of searching for suppliers and products may be taken over by computer programmes which have defined rules or some degree of intelligence that replicates human neural functioning. These programmes are known as:

(A) HTML
(B) Spider search engines
(C) E-marketplace search engines
(D) Software intelligent agents

(xi) Production related procurement refers to the purchasing of:

(A) Information systems
(B) Furniture
(C) Office supplies
(D) Raw materials

(xii) In addition to having an e-business strategy, an e-marketing strategy also needs to be developed and there are three main operational processes involved. Which one is FALSE?

(A) Customer acquisition
(B) Customer retention and growth
(C) Customer focus group development
(D) Customer conversion

(xiii) Achieving marketing objectives through the use of electronic communications technology is a general definition of:

(A) E-marketing plan
(B) E-marketing
(C) The marketing concept
(D) Marketing orientation

(xiv) Building and sustaining long term business with customers is the aim of :

(A) Customer relationship management
(B) Customer management
(C) Customer acquisition
(D) Electronic customer relationship management

(xv) A key CRM technique is a sub-set of cross-selling, but in this case selling more expensive products. This is:
(A) Cross-sell
(B) Referral
(C) Reactivation
(D) Up-sell

2. Define **Any Five** of the following: **(15 marks)**

(a) Digital business

(b) Strategy implementation

(c) Data controller

(d) Dedicated server

(e) Customer conversion

(f) Enterprise resource planning(ERP)

(g) Persona

3. Write short notes on **ANY FOUR** of the following: **(20 marks)**

(a) Describe the different levels of strategy for larger or globalization organization.

(b) Explain what is meant by buy-side and sell-side e-commerce.
(c) Describe **four** different perspectives for e-commerce.
(d) What is the difference between a push orientation to the value chain and pull orientation.
(e) Define MRO. Explain about systematic sourcing and spot sourcing.
(f) **Five** key drivers of e-procurement adoption.

4(a) Explain disintermediation and reintermediation using examples. **(5 marks)**

(b)Explain about Business-to-consumer(B2C),Business-to-business(B2B),Consumer-to-business(C2B)

(5 marks)

5. What is Customer relationship management(CRM)?. Explain the **four** activities that comprise CRM? **(10 marks)**

6. Answer **ANY Three** of the following: **(30 marks)**

(a) Explain the supply chain management?
(b) What is e-procurement? Describe classification of different type or application of e-procurement.

(c) Define digital marketing plan. Explain about customer demand analysis of e-commerce services in different market segments,
(d) Define environment scanning. Describe about SLEPT factors.

Department of Higher Education
University of Computer Studies, Hinthada
Fourth Year (B.C.Sc/ B.C.Tech.)
Final Examination
Mathematics of Computing IV (CST-402)
September, 2018

Answer All Questions **Time Allowed: 3 Hours.**

1.(a) Messages are transmitted over a communications channel using two signals. The transmittal of one signal requires 1 microsecond, and the transmittal of the other signal requires 2 microseconds.

(i) Find a recurrence relation for the number of different messages consisting of sequences of these two signals, where each signal in the message is immediately followed by the next signal, that can be sent in n microseconds.

(ii) What are the initial conditions?

(iii) How many different messages can be sent in 12 microseconds using these two signals?

(b) Determine whether the recurrence relation $a_n = -3a_{n-1} - 3a_{n-2} - a_{n-3}$ is linear homogeneous or not? What is degree? Solve the recurrence relation with initial conditions $a_0 = 5, a_1 = -9,$ and $a_2 = 15.$

2.(a) Find all solutions of the recurrence relation $a_n = 2a_{n-1} + 2n^2$.

(b) Find a closed form for the generating function for the sequence $a_n = \binom{8}{n}$ for $n = 0, 1, 2, \ldots$

(c) Use generation functions to determine the number of different ways 15 identical cats can be given to six children so that each child receives at least one but no more than three cats.

3.(a) Use generating functions to solve the recurrence relation $a_k = 3a_{k-1} + 2$ with initial condition $a_0 = 1.$

(b) Let $G = (V, T, S, P)$ be the phase structure grammer with $V = \{0,1, A, S\}$, $T = \{0,1\}$ and set of production P consisting of $S \to 1S$, $S \to 00A$, $A \to 0A$ and $A \to 0$.

(i) Show that 111000 belongs to the language generated by G .

(ii) Show that 11001 does not belong to the language generated by G.

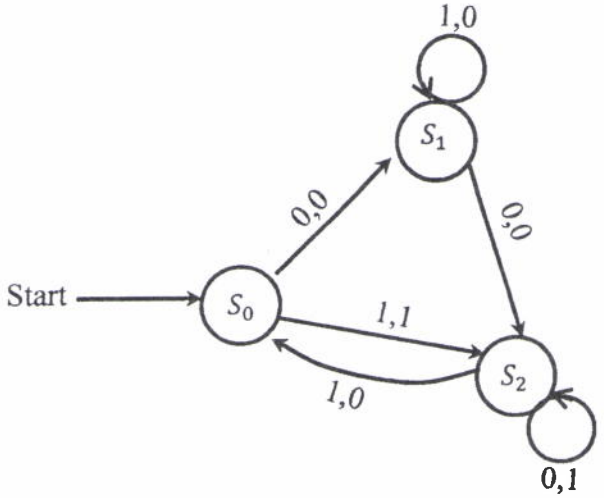
(iii) What is the language generated by G .

(c) Let G be the grammar with $= \{a, b, c, S\}$; $T = \{a, b, c\}$; starting symbol S; and production $S \to abS$, $S \to bcS$, $S \to bbS$, $S \to a$,and $S \to cb$. Construct derivation trees for $bcbba$.

4.(a) (i) Draw the state diagram for the finite- state machine with these state table

State	f		g	
	Input		***Input***	
	0	**1**	**0**	**1**
s_0	s_1	s_0	0	0
s_1	s_2	s_0	1	1
s_2	s_0	s_3	0	1
s_3	s_1	s_2	1	0

(ii) Find the output for each of these input strings when given an input to the finite-state machine in the following figure; (a) 0111 (b)11011011 (c) 01010101010.



(b) Construct pharse-structure grammars to generate each of these sets.

(i) $\{0^n \mid n \geq 0\}$ (ii) $\{1^n 0 \mid n \geq 0\}$ (iii) $\{(000)^n \mid n \geq 0\}$

5.(a) Construct deterministic finite- state automata that recognize each of these languages;

(i) the set of bit strings that contain the string 101

(ii) the set of bit strings that end with two 0s

(b) Determine whether 1011 belongs to each of these regular sets

(i) 10^*1^* (ii) $(10)^*1011$ (iii) $(10)^*(11)^*$ (iv) $0^*(10 \cup 11)^*$ (v) $1(00)^*(11)^*$

(c) Let T be the Turning machine defined by the five tuples: $(s_0, 0, s_1, 1, R)$, $(s_0, 1, s_1, 0, R)$, $(s_0, B, s_1, 0, R)$, $(s_1, 0, s_2, 1, L)$, $(s_1, 1, s_1, 0, R)$, $(s_1, B, s_2, 0, L)$.

For each of these initial tapes, determine the final tape when T halts, assuming that T begins in initial position

...	B	B	1	0	1	B	B	B	...

Department of Higher Education
University of Computer Studies, Hinthada
Fourth Year (B.C.Sc.)
Final Examination
Operating System (CS-403)
September 2018

Answer All Questions. **Time Allowed: 3 Hours**

1. Choose the correct answer of the followings. **(10 marks)**

(i) The initial value of the semaphore that allows only one of the many processes to enter their critical sections, is
A. 8 B. 1 C.16 D.0

(ii) For necessary conditions for deadlock to exist are: mutual exclusion, no-preemption, circular-wait and
A. Deadlock avoidance B. Race condition C. Hold and wait D. Buffer overflow

(iii) Physical memory is divided into fixed-size blocks called _____.
A. Frames B. Paging C. Segmentation D. Demand segmentation

(iv) In which of the storage placement strategies a program is placed in the smallest available hole on the main memory?
A. Best-fit B. First-fit C. Worst-fit D. Buddy

(v) The LRU algorithm
A. Pages out pages that have been used recently
B. Pages out pages that have not been used recently
C. Pages out pages that has not been used for the longest period of time
D. Pages out the first page in a given area

(vi) _____ can be used to provide virtual memory.
A. Demand paging C. Pure demand paging
B. Demand segmentation D. None of them

(vii) An _____ is a series of code sections that the loader can bring into memory and execute.
A. Source file B. Text file C. Executable file D. Object file

(viii) Database systems are used _____ method.
A. Sequential access B. Direct access C. Other access D. None of them

(ix) A page fault
A. Is an error is a specific page
B. Occurs when a program accesses a page of memory
C. Is an access to a page not currently in memory
D. Is a reference to a page belonging to another program

(x) Thrashing can be avoided if
A. The pages, belonging to the working set of the programs, are in main memory
B. The speed of CPU is increased
C. The speed of I/O processor is increased
D. All of them

2. (a) Define ANY FIVE of the followings: **(10 marks)**

(i) Critical section
(ii) Deadlock prevention
(iii)Roll-out, roll-in
(iv)Thrashing
(v) Absolute path name
(vi)Virtual file system

(b) Differentiate ANY FIVE of the followings: **(20 marks)**

(i) Logical address space and Physical address space
(ii) Demand paging and Demand segmentation
(iii)Direct access and Index access method
(iv)Global allocation and Local allocation
(v) Bit vector and linked list
(vi)Deadlock prevention and Deadlock avoidance

3. Answer ANY FIVE of the followings: **(20 marks)**

(i) Explain about the implementation of semaphore to avoid busy waiting.
(ii) Discuss the possible approaches to avoid deadlock.
(iii)Briefly explain about overlay memory technique.
(iv)Discuss the hardware support required to support demand paging.
(v) The operating system allocates tables containing information about all open files, namely open-file table. Give the data structure of open-file table.
(vi)Write a short note on virtual file system.

4.(a) List the different directory structure and discuss advantages and disadvantages of those directory structures. **(10 marks)**

(b) Consider the following snapshot of the system: **(10 marks)**

	Allocation				**Max**				**Available**			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

(i) Compute the Need Matrix.
(ii) In this system in a safe or unsafe state? Why?
(iii) In this system current in deadlock? Why?
(iv) If a request from process P_1 arrives for (0,4,2,0), can the request be granted immediately?

5.(a) (i) Consider the following segment table: **(4 marks)**

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580

What are the physical addresses for the following logical addresses?

a. 0430
b. 110
c. 2500
d. 3400

(ii) Consider the following page-reference string: **(6 marks)**

2,6,1,5, 7,7,7,7,7,5,1,6,2,3,4,1,2,3,4,4

How many page faults would occur for the OPT and LRU replacement algorithms with 'four' memory frames?

(b) What is contiguous allocation? Consider a file currently consisting of 100 blocks. Assume that the FCB (and the index block, in the case of indexed allocation) is already in memory. Calculate how many disk I/O operations are required for contiguous, linked, and indexed (single-level) allocation strategies, if, for one block, the following conditions hold. In the contiguous allocation case, assume that there is no room to grow in the beginning, but room to grow in the end. Assume that the block information to be added is stored in memory.

a. The block is added at the beginning.
b. The block is added in the middle.
c. The block is added at the end.
d. The block is removed from the beginning.
e. The block is removed from the middle.
f. The block is removed from the end. **(10 marks)**

**********END**********

Department of Higher Education
University of Computer Studies, Hinthada
Fourth Year (B.C.Sc.)
Final Examination
Management Information System + Information Assurance and Security (CS-404)
September, 2018

Answer All Questions. **Time Allowed: 3 Hours**

Management Information System

I. Choose the correct answer(s) for the following statements. (10-marks)

(1) The long-range strategic decisions about products and services as well as the finical performance of the firm, called_____.
(A) Senior management (B) middle management
(C) Operational management (D) sales and marketing

(2) A stable, formal social structure that takes resources from the environment and processes them to produce output is called a (an) _____.
(A)Micro system (B) Organization (C) Bureaucracy (D) Value chain

(3) In organization, routines for producing goods and services are sometimes called_____.
(A) Bureaucratic structure (B) Standard operating procedures
(C)Mediating factors (D) Work with routine tasks

(4) The principles of right and wrong that individuals, acting as free moral agents, use to make choices to guide their behaviors are called _____.
(A) Ethics (B) Social (C) Political (D) Privacy

(5) Which can secretly install itself on an Internet user's company by piggybacking on larger application?
(A) Spyware (B) Cookies (C) Web beacons (D) none

(6) Which model views the firm as a series of primary and support activities that add value to a firm's product or services?
(A) Process (B) Business (C) Supplier (D) value chain

(7) The major business function consists of _____ functions.
(A) One (B) Two (C) Three (D) Four

(8) The purpose of manufacturing and production function is selling the organization's product and services. (True/False)

(9) In an information society, accountability is extends the concept of responsibility further to the area of laws. (True/False)

(10) Routines are precise rules, procedures and practices that have been developed to cope with virtually all expected situations. (True/False)

II. Write short notes for **ANY FOUR** of the following. (20-marks)

(a) Describe the characteristics of a digital firm.
(b) Describe the organizational, management, and technology dimensions of information systems.
(c) Explain how the value chain model can be used to identify opportunities for information systems.
(d) Describe the major business functions of information systems.
(e) Identify and describe six ethical principles.
(f) List and describe six reasons why information systems are so important for business today.

III. The organization is devoted to the principle of efficiency: maximizing output using limited inputs. Other features of organizations include their business processes, organizational culture, and organizational politics, surrounding environments, structure, goals, constituencies and leadership styles. Describe the features of organizations that help explain differences in organizations' use of information systems. (10-marks)

IV. Mini **case Study** for value chain. (10-marks)

The stages of the company value chain begin with inbound logistics that connect the firm to its suppliers, continue the operations stage where actual products are produced, and end with the three stages interacting with the customers: outbound logistics, marketing and sales and service.

Supporting Hospital value chain with information systems by mapping onto the company value chain. Work through the value chain of a hospital supporting patients, treatment them, assisting in their discharges, and offering patient satisfactions and services.

(a) State activities of inbound logistics for hospital chain.
(b) State activities of operations for hospital value chain.
(c) State activities of outbound logistics for hospital value chain.
(d) State activities of marketing and sales for hospital value chain.
(e) State activities of service logistics for hospital value chain.

Information Assurance and Security

I. Choose the answer for the following statements: (10 marks)

(1) You work in the office of a large company. You receive a call from a person claiming to be from the Helpdesk. He asks you for your password. What kind of threat is this?
(A) Natural threat (B) Organizational threat (C) Social Engineering (D) None of these

(2) In the context of information security defined by ISO/IEC 27001, which of the following is the property of safeguarding the accuracy and completeness of information assets?
(A) Authentication (B) Availability (C) Confidentiality (D) Integrity

(3) Which of the following refers to a series of characters used to verify a user's identity?
(A) Token serial number (B) User ID (C) Password (D) Security ticket

(4) Why does buffer overflow happen?
   (A) Because they are an easy weakness to exploit
   (B) Because buffers can only hold so much data
   (C)Because input data is not checked for appropriate length at time of input
   (D) Because of insufficient system memory

(5) A method by which a hacker tries to gain access to an account on the target system by trying to guess the correct password is called:
   (A) Password cracking (B)Default credential attack (C) Cross-site scripting (D) Brute-force attack

(6) When constructing a password, which statements are True or False.
   (A) Use your family member name, sports name and add a number on the end.
   (B) Use phrases or misspelled words with embedded numbers and special characters.
   (C) Use sequenced letters and numbers from your keyboard.
   (D) Use your birthday.
   (E) Use the characters, numbers and special characters that you may only know

II. Write short notes for **Any FIVE** of the following: (20 marks)

(1) Information security with its goals.
(2) The primary differences between virus and worm.
(3) What are general assets? Idiosyncratic assets?
(4) What is asset sensitivity? Describe different classes of sensitivity.
(5) Describe the lack of input validation vulnerability.
(6) What is asset criticality? Describe different classes of criticality.
(7) What are internal threat agents? Which of these do you think is the most dangerous?

III. (a) **Case Study One**

The H University has server A,B,C,D, and E to maintain the Student related information such as student roll number, name, contact, roll call gained, transcripts for alumni, etc., the exam related information such as exam questions, tutorial marks, project marks, exam marks, etc. and other university related information. To secure data in the server, there is a committee of server administrator organized by at least three head of the department of the university. They use the same admin password to protect the system. And two servers use the single network card and the other three servers have their network cable plugged in to the same network switch. These serves are placed in the same room with only one UPS. The UPS seems to be running at 90% capacity and estimate 10 minute uptime before it fails. Many faculty members house their own server in their rooms. Desktop support technicians use the same admin password to access all workstations in the department. Additionally, administrative committee uses the antivirus software to protect from virus/worms.

Consider the following questions based on above **case study one**.

(Q1) What assets are stored in the H University? List them all. (3 marks)

(Q2) According to your suggested assets, classify asset sensitivity and criticality for each of these. (3 marks)

(Q3) Which threats can be exploited to H University? (2 marks)

(Q4) When your suggested threats occur, identify information security area (CIA) that was affected to your assets. (2 marks)

III.(b) Case Study Two

USES OF A HACKED PC

We have seen in this chapter that attackers are always looking for ways to obtain control of a computer connected to the Internet. Brian Krebs, author of the popular information security blog, krebsonsecurity, has plotted the possible uses of a compromised PC in Figure.

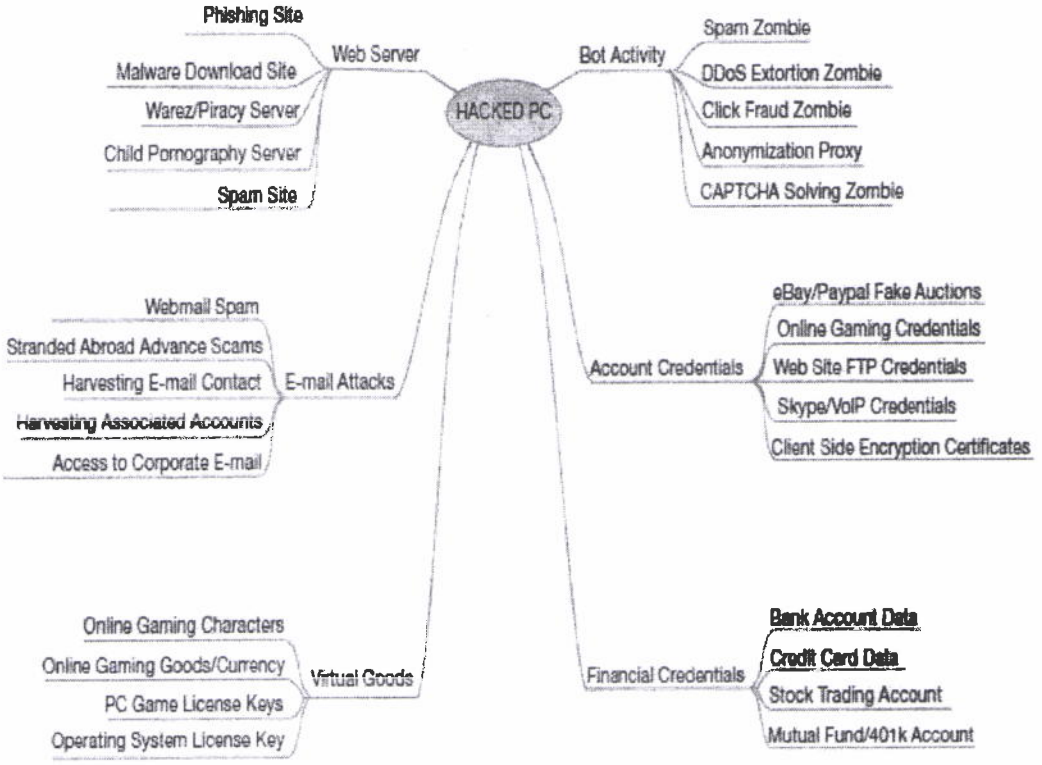


Figure Uses of a hacked PC

Consider the following questions based on above ***case study two***.

(Q1) If your PC were compromised, provide a brief description of how your PC could be used by an attacker to perform any three of the above activities. **(5 marks)**

(Q2) When trying to hack your PC, which vulnerabilities can be taken by an attacker? Discuss these vulnerabilities. **(5 marks)**

**********END**********

Department of Higher Education

University of Computer Studies, Hinthada

Fourth Year (B.C.Sc.)

Unified Modeling Language (CS-405)

October, 2018

Answer all questions. **Time Allowed : 3 Hours**

I.(a) Choose the correct answer(s) for the following statements: (15 marks)

(1) The architecture where a set of high level decisions about the system will be divided into subsystem is :

(A) layer architecture (B) software architecture

(C) hardware architecture (D) middleware

(2) The MVC architecture distinguishes objects to control object complex interactions, they are called .....

(A) instances (B) messages (C) objects (D) controllers

(3) In the Unified Process, objects are categorized by distinguishing ....., control and entity objects.

(A) view (B) control (C) entity (D) boundary

(4) The entity objects in the Unified Process are responsible for .....

(A) receiving user input (B) forwarding messages

(C) maintaining data (D) updating user interface

(5) The ..... stereotype denotes a dependency between two model elements that represent the same concept but in different models

(A) trace (B) friend (C) include (D) none

(6) A dependency between the source file and the package is .....

(A) import (B) include (C) implement (D) none

(7) ..... are transitions that have no event labels. They can be triggered when a state's internal activity terminates normally without being interrupted by an external event.

(A) Completion transition (B) Internal transition

(C) Self transition (D) External transition

(8) The technique of replacing an association with a class is called .....

(A) reification (B) association class

(C) qualified association (D) mapping class

(9) The different ..... that people can fill when they interact with a system are known as actors.

(A) roles (B) names (C) tasks (D) domain

(10) Typical inputs to the analysis activity are the use case and .....models.

(A) class (B) object (C) domain (D) all of the above

(11) A general association linking any number of classes is called .....

(A) binary association (B) self association

(C) ternary association (D) unary association

(12) Many of the relationships on implementation diagrams are depicted using ..... relationship.

(A) association (B) dependency (C) generalization (D) realization

(13) The .....deals with issues of concurrency within the system.

(A) design view (B) process view

(C) deployment view (D) implementation view

(14) Constructor operations are .....scope of UML.

(A) class (B) instance (C) component (D) value

(15) In MVC architecture , the objects are categorized to control complex interactions and they are responsible for :

(A) receiving user input (B) forwarding messages

(C) updating the system state (D) none of these

I.(b) Which of the following object diagrams are **true or false** for given Class Diagram? (5 marks)

Given Class diagram:

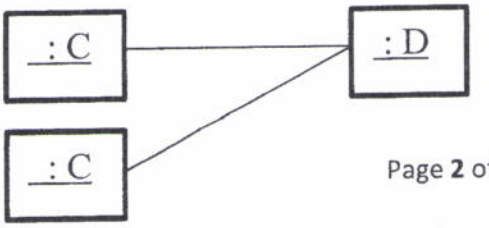
(1)

(True / False)

(2)

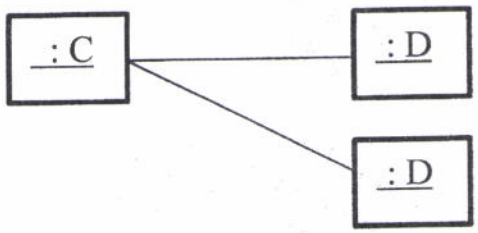
(True / False)

(3)



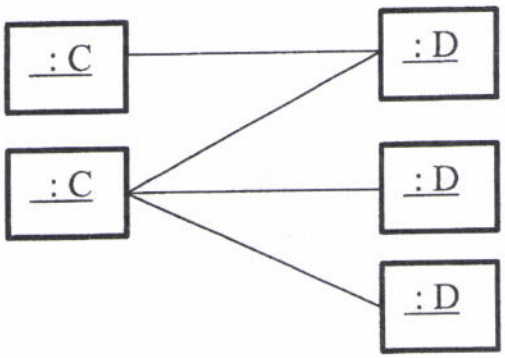
(True / False)

(4)



(True / False)

(5)



(True / False)

II. Write short notes on the differences between ***ANY FOUR*** of the following pair: (20 marks)

(a) Analysis / design of a system
(b) Class / object diagram
(c) Sequence / collaboration diagram
(d) State / state transaction of an object
(e) Classifier role and association role
(f) Aggregation / association / composition

III.(a) Draw a **use-case diagram** for the following system with appropriate actors and use-cases.

The Online Bus Ticket Reservation System is used to book tickets for some local trips. Using the system, the customer can browse through departure place, destination place, trip schedule; departure/arrival times and can select bus. While booking the bus, customer has to give mobile number, name, email address and number of tickets want. After selection the bus and journey root, if the ticket is available then customer can select the seat in bus. Then we can make payment for the ticket. When payment is successful, a SMS is sent to given mobile number for the ticket booking confirmation or user can print the ticket from home page of the online system. The ticket can be cancelled by entering ticket number and email id that is given while booking the ticket. After cancel process successful, the confirmation message will be sent to mobile number.

III.(b) Write a ticket reservation **use case description** for above Online Bus Ticket Reservation system. (15 marks)

IV.(a) Draw a **class diagram** representing the following problem domain for a hockey league and be sure to label all associations with appropriate multiplicities.

A hockey league is made up of at least four hockey teams. Each hockey team is composed of six to twelve players, and one player captains the team. A team has a name and record. Players

have a number and a position. Hockey teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and number of years of experience, and can coach multiple teams. Coaches and players are people, and people have names and addresses.

IV. (b) Draw an **object diagram** that is an instance of the class diagram you have drawn for question **IV(a)** by defining the appropriate labels on the links between objects. (15 mark)

V.(a) The code given below shows a class **DataSet**, which provides basic statistical functionality on a set of data, and a class **ExamMarks**, which uses DataSet to store and work out the average from a set of exam marks. The ***main function*** reads in two marks and uses **ExamMarks** class to store them and print out the average. Draw a **Sequence diagram** and **Collaboration diagram** showing the interaction that takes place when the main function executes. (15 mark)

```
class DataSet{
      private float data[];
      private int items;
      public DataSet(){
            data=new float(256);
            items=0;
     }
     public void addDataPoint(float d){
          data[items++]=d;
     }
      public float mean(){
          float total=0;
          for(int i=0;i<getSize;i++){
              total+=data[i];
     }
      Return total/getSize();
}
public int getSize(){
     return items;
 }
}
```

```
class ExamMarks{
  private DataSet marks;
  public void enterMark(float m){
     if(marks==null){
          marks=new DataSet();
     }
      marks.addDataPoint(m);
  }
   float average(){
    return marks.mean();
   }
}
```

```
public class Average{
public static void main(String args[] ){
  ExamMarks exam=
                new ExamMarks();
  exam.enterMark(56);
  exam.enterMark(72);
 System.out.println(exam.average());
}
}
```

V.(b) A window in a window management system on a computer can be displayed in one of three states: maximized, where it takes up the entire screen; normal, where it is displayed as a bordered window with a given size and position on the screen; and iconized, where it is displayed as a small icon. When a window is opened, it will be displayed as a normal window, unless minimize on use has been selected, in which case it will be displayed as an icon. A normal window and an icon can be maximized; a maximized window and a normal window can be minimized or reduced to an icon. Maximized windows can be restored to their normal size and icons can be restored to the size they had before they were minimized. Icons and normal windows can be moved and normal windows can also be resized. No matter how it is displayed, a window can always be closed.

(i) Draw a **state diagram** expressing these facts about the display of windows.

(ii) Write **scenario** for the state chart you answered. (15 marks)