National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Professional Issues in IT	Course Code:	CS449
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	Exam Duration:	180 Minutes	Total Marks:	86
	Paper Date:	24-Dec-2019	Weight	40
	Section:	ALL	Page(s):	7
	Exam Type:	Final Exam		

Student : Name:_____ Roll No._____ Section:_____

Instruction/Notes: Provide precise answers in the given space. Longer answers will be discarded.
Think carefully before writing the answer.

Q1. [8 marks]

Choose the correct answer

1. A professional is someone who:
    a. Requires advanced training and experience
    b. Must exercise discretion and judgment in the course of his or her work
    c. Does work that cannot be standardized
    d. All of the above

2. A set of programs that enables a hacker to gain administrative level access to a computer without the end user's consent or knowledge is called a(n):
    a. Trojan horse
    b. Logic bomb
    c. Rootkit
    d. Worm

3. You read online that snake oil has benefits for arthritis patients. Which of the following, if you see, will make a convincing case for these benefits:
    a. A facebook post claiming these benefits
    b. A study published in a journal showing its effects on a 1000 arthritis patients
    c. A news item on CNN
    d. An online article mentioning how using snake oil was an ancient Chinese practice

4. _____ is an effort by an employee to attract attention to a negligent, illegal, unethical, abusive, or dangerous act by a company that threatens the public interest.
    a. Reporting
    b. Informing
    c. Whistleblowing
    d. Social Communication

Q2. [5 marks]

Department of Computer Science

You are a member of the application development organization for a small but rapidly growing software company that produces patient billing applications for doctors' offices. During work on the next release of your firm's one and only software product, you discover a small programming glitch in the current release that could pose a security risk to users. The probability of the problem being discovered is low, but if exposed, the potential impact on your firm's 100 or so customers could be substantial: hackers could access private patient data and change billing records. The problem will be corrected in the next release, scheduled to come out in three months, but you are concerned about what should be done for the users of the current release.

The problem has come at the worst possible time. The firm is seeking approval for a $10 million loan to raise enough cash to continue operations until revenue from the sales of its just-released product offsets expenses. In addition, the effort to develop and distribute the patch, to communicate with users, and to deal with any fallout will place a major drain on your small development staff, delaying the next software release by at least two months. You have your regularly scheduled quarterly meeting with the manager of application development this afternoon; what will you say about this problem?

It is your ethical duty to be transparent and communicate about the security risk to the patient data. Furthemore, you should suggest a course of action for fixing the issue as soon as possible and let the management decide.

You should not hide any information even if it is impacting the project of the company which will be unethical.

Q3. [10 marks]

You are the team lead of your project and you need to prioritize and manage time for a number of tasks listed in the table below. Tag each of the tasks for importance and urgency and identify its relevant quadrant.

Item	Tags (important and/or urgent)	Quadrant (1/2/3/4)
Write 10 coding modules	**important, not urgent**	**2**
reply to email from customer	**urgent, important**	**1**
run backup scripts for server maintenance	**important, not urgent**	**2**
preparation for upcoming meeting	**important, not urgent**	**2**
send team's resumes required by HR	**urgent, not important**	**3**
track work hours for each team member	**urgent, not important**	**3**

Q4. [10 marks]

What is the "Fair Use Doctrine"?

Allows portions of copyrighted materials to be used without permission under certain circumstances e.g. teaching, criticism, reporting, comment etc.

Describe the four factors U.S. Copyright Law wants the courts to consider when deciding a copyright case.

1. **the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;**
2. **the nature of the copyrighted work;**
3. **the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and**
4. **the effect of the use upon the potential market for or value of the copyrighted work.**

Q5. [8 marks]

Explain how MongoDB achieves scalability?

MongoDB achieves scalability using distributed architecture and storing data in the form of independent documents. It does not have to keep track of referential integrity and strict schema during read/write.

Explain the difference between Declarative vs Imperative/Procedural Programming

In declarative programming you just specify what to do like in Functional Programming.

In Imperative programming you specify how to do something by providing detailed instructions.

List the most important delivery challenge that DevOps addresses?

DevOps addresses the challenge of communication between development, operations and support teams.

Q6. [10 marks]

You work for TeamViewer Inc. and your core team has developed the entire software. Your company is, at this stage, concerned about copyright infringements on different parts of your product. The team informs you that the software is a combination of:

1. Innovative video streaming algorithms,
2. P2P speed enhancement techniques already in use,
3. Programming hacks and implementation tricks your coders developed over the years,
4. General session maintenance tools and front-end graphics

For each of the parts above, you have the choice to file a patent, register a copyright, keep it as a trade secret, or make it public for usage. Which one will you choose keeping in mind the company's profitability and constraints of each part? Give reasons.

1. **File a patent**
2. **Make it public**
3. **Keep it as trade secret**
4. **Register a copyright**

Q7. [10 marks]

Define the terms

Defensive publishing

 Alternative for patent which is low cost and you ensure that no one else can claim ownership of the technology and benefit commercially.

 Non-disclosure agreement

Agreement between company and employee for not disclosing company's secret information with outside entities.

 Cross-licensing agreement

Agreement between companies to use each other's patented technology.

Distinguish between:

Industrial espionage and competitive intelligence.

Competitive intelligence is gathered using publicly available information and sources and is the legal way of gathering intelligence.

Industrial espionage is using unauthorized and unethical means to gather confidential information about a competitor.

Q8. [10 marks]

Define Consumer Profiling

It is the collection of personal information of users by companies sometime without their explicit permission.

List two ways in which consumer profiling is done in the web/online environment

At registration time

Forms, surveys

Using cookies to track user activity

List two methods by which consumer profiling is done outside the web/online environment

Each time user

- uses credit card,

- fills out a warranty card,

- answers a phone survey,

- buys groceries using a store loyalty card

Q9. [15 marks]

Opportunity Cost of capital is the loss of income you could have received by investing the money somewhere else, in a suitable interest bearing account for example. Calculate the opportunity cost for you under the following scenario given the interest rate of 15%.

Five years ago you have given a loan of 100,000 PKR to one of your friends. Your friend has returned the loan during the last five years with 20,000 PKR per year. What is the opportunity cost of this transaction for you? (Remember to factor in returned amounts)

15%	Discount Rate			
Past Year Number	Loaned amount	Returned Amount	Present Value of loaned amount	Present Value of return amount
5	100,000	-	201,135.72	-
4		20,000	-	34,980.13
3		20,000	-	30,417.50
2		20,000	-	26,450.00
1		20,000	-	23,000.00
0		20,000	-	20,000.00
Total	100,000	100,000	201,135.72	134,847.63
		Present value of initial amount:	201,135.72	
		Peresent value of returned amounts:	134,847.63	
		Opportunity cost:	**66,288.09**	
	OR			
		Would have earned on initial amount:	101,135.72	
		Earned on the returned amount:	34,847.63	
		Opportunity cost:	**66,288.09**	