National University of Computer and Emerging Sciences, Lahore Campus

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

Instruction/Notes: Attempt all questions on question paper in the space given below each question.

QUESTION1: Why profession is divided on compulsory registration of software engineers? [5]

A number of disasters can be traced directly to lack of professional competence on the part of the software engineers who developed the systems. Therac-25 in the USA and the London Ambulance System in the UK are only two of many examples that show how the professional incompetence of software developers can lead to avoidable deaths. In both these examples, the developers lacked any professional qualifications in software engineering and were ignorant of such elementary topics as the risks of concurrent access to shared memory and the dangers of dynamic memory allocation, as well as many more advanced topics. While the immediate cause of the failure of these systems was programming error arising from ignorance of elementary topics, these errors occurred in a context that showed a much broader lack of professionalism.

Danger to the public arising from professional incompetence was one of the driving forces that led to American legislation reserving the engineering function to those who were properly registered and hence appropriately qualified. It is not surprising, therefore, that there have been calls for the compulsory registration of software engineers and for legislation to ensure that software engineering activities are carried out under the supervision of registered software engineers.

Despite the efforts to introduce such a regime in the state of Texas (see the article by Bagert (2002) listed in the 'Further reading' section below), there has been very little progress in this direction. Furthermore, the profession is very divided on the issue.

Some members of the profession have advocated a legal requirement that all software must be written by registered software engineers, or at least under their supervision. Such a regulation would be impossible to enforce. The number of people qualified to be registered as software engineers is vastly fewer than the number of people developing software. If such a regulation were introduced, the amount of new software that could be developed would be enormously reduced or, more likely, software development would go underground. Furthermore, there would be considerable opposition to the regulation. Many software developers would see it as an attempt to establish a monopoly by a small number of people with specific qualifications, with the intention of pushing up their own earnings. The public would share this view and see the move as unnecessary, because most software is not critical.

It would be more realistic and more defensible to require that the design and implementation of all 'critical' systems should be under the control of a registered software engineer (i.e. in the UK, a Chartered Engineer whose experience and qualifications are in software engineering). By a critical system, we mean a system whose failure to operate correctly could result in physical injury or loss of life,

or catastrophic economic damage. Society is justified in demanding that such systems are designed and implemented by properly qualified and experienced engineers. One difficulty is that the boundary between critical and non-critical systems is not always well defined. While it is clear that an air traffic control system should be considered critical, because a failure can result directly in loss of life, should we consider a medical records system to be critical, because the loss of information concerning, say, a patient's allergy to penicillin could in some circumstances lead to the death of the patient? A second difficulty is that many Chartered Engineers who are qualified in software engineering have not studied the rather specialized techniques needed for working on critical systems. Nor, for the jobs they are doing, is it necessary that they should. In the UK context, compulsory reservation of function for software engineers, even for critical systems work, is unlikely to be realistic except as part of a move towards reservation of function for engineers more generally. There is little sign of this happening. If anything, it is indirect pressures from the Health and Safety Executive or from insurers providing professional indemnity insurance that is likely to increase the emphasis on registration as a Chartered Engineer.

QUESTION2: State few arguments put in favor of Outsourcing. [5]

·It frees management to concentrate on the core business of the company.
· It makes the costs of IT more visible and therefore easier to control.
· Specialist companies are able to produce and operate more effective systems because:
· they have much wider experience of system development than do user companies;
· they can justify employing highly specialized staff;
·working in a specialized IT company provides a better career path for
IT staff than working for a user organization.
· Overall, it saves money.

QUESTION3: What does the term precedence mean in the context of common law? Who makes laws in a common law system? [5]

The common law is essentially traditional law that is not written down but which depends on the judgment of judges over the centuries. When deciding the rights and wrongs of a case, a court will look at the way in which similar cases have been decided in the past; such cases are known as **precedents**.
The common law tradition is shared by many other countries. Almost all the countries of the Commonwealth share the tradition; so, most importantly, does the United States of America. This means that a judgment made by a judge in the United States can be used as a precedent in, for example, a court in Singapore, or vice versa. The tradition of common law is not found in the countries of continental Europe, such as France and Germany. Their law is based entirely on written codes, one for the criminal law and one for the civil law. Those parts of the world that were once colonized by such countries have generally kept such a system of written codes. Confusingly, this system of written codes is often also referred to as civil law. However, in this book, we shall always use the term civil law in the sense described in the previous section, that is, the law used for settling disputes between people.

QUESTION4: You are planning to start a business of your own, please illustrate the major elements of your startup that require finance, How much finance do you require and how do you plan to source this requirement? [5]

Elements of startup that required finance and sources to fund them, depend on the startup.

QUESTION5: What is the relationship between loan capital and equity capital? Explain from the point of views of shareholder and lender. [4]

The relationship between loan capital and equity capital in a company is important. It is known as **gearing** or **leverage**. Shareholders are at a much greater risk of getting a poor return on their capital or even losing it completely than are lenders but, in compensation for this, they stand to make a greater profit than lenders if all goes well.
High levels of gearing are undesirable both from the point of view of the shareholders, because so much of the company's income is committed to interest payments, and from the point of view of the lenders, because shareholders may encourage the company to trade recklessly in the knowledge that they have little to lose and a lot to gain. Most lenders will be reluctant to lend money if a company seems too highly geared

QUESTION6: Considering *Professional Code of Conduct,* how the terms "Duty to the Profession" and "Duty to the relevant authority" relate with IT Professional. [6]

Duty to the Profession:

Like other professions, information systems professionals have not always had a good press. System development has been plagued by delays, budget overruns and completes failures, and these have been well publicized. Too often, the systems themselves do not meet the needs of their users. And information systems professionals have, on occasions, been perceived as behaving in an unprofessional manner. The purpose of this section of the Code is to impress on members what is expected of them in order to uphold the reputation and good standing of the BCS in particular, and the profession in general.

Duty to relevant authority:

The term relevant authority means the person or organization that has authority over what you are doing. If you are employed by an organization, this is likely to be your employer; if you are an independent consultant, it will be your client; and if you are a student, it will be your school, college or university.
In some cases, there may be several relevant authorities; for example, if you are a part-time student who is also employed part time, then the relevant authority as far as your work as a student is concerned will be your school or college, but the relevant authority in your employment will be your employer.
Members of the BCS are expected to behave professionally towards the relevant authority and this means, in particular, the following:
Avoid conflicts of interest. Suppose, for example, that your client has asked you to select the supplier for a new and expensive computer system and your husband or wife is the sales manager of one of the potential suppliers. In this situation, it may well be that your judgment would be compromised. You should tell your client about the conflict of interest and explain that it would be better if they found someone else to make the selection.
Avoid misrepresentation, for example, claiming that a piece of software can do something that it can't, or that your company is competent in an area where it is not. In particular, don't take advantage of the fact that other people know less than you. This clause addresses a failing which is, sadly, only too common in the software industry.
Don't pass on confidential information without permission. Confidential information may include technical information about a company's products, management information relating, say, to its financial position, sales leads, and so on
QUESTION7: Compare sole trader, partnership and a limited company. Explain the term limited liability and contrast it with the liability of sole traders and partners in partnership [3+2]

A **sole trader** is an individual who runs his or her own business. There are no legal formalities attached to becoming a sole trader; you become a sole trader simply by starting to run a business.

A sole trader is personally liable for all the debts of the business so that all the trader's assets, including the family home, are at risk if the business fails. For this reason, anyone who is in business in anything other than a very small way should not operate as a sole trader.
If a group of people carry on a business with a view to making profits, and the business is not a limited company, then the law will treat them as being in a **partnership**. The most important consequence of the Partnership Act is that the liability of the partners is unlimited and that the partners are **jointly and severally** responsible for the partnership's liabilities

By far the commonest form of commercial organization, however, is the limited company. The company has corporate legal identity, that is, it is a legal person, completely separate from the people who work in it or the people who own it.
The ownership of the company is divided into a (usually large) number of shares. These shares can be bought and sold individually. The people who own these shares are known as the members of the company or shareholders.
In the event that the company incurs debts or other legal liabilities, the owners of the company have no obligation to pay these. The most that shareholders stand to lose is the money they paid for their shares