Data Provided: None

The University Of Sheffield.

DEPARTMENT OF ELECTRONIC AND ELECTRICAL ENGINEERING

Spring Semester 2009-2010 (2 hours)

Professional Issues in Engineering 2

Answer **THREE** questions. **No marks will be awarded for solutions to a fourth question.** Solutions will be considered in the order that they are presented in the answer book. Trial answers will be ignored if they are clearly crossed out. **The numbers given after each section of a question indicate the relative weighting of that section.**

1.

a. In the context of Data Protection legislation, explain the roles of the following types of person:

(i) Data Subject

(ii) Data Controller

(iii) Data Processor **(6)**

b. Patrick McGregor obtains a degree in Electronics and Electrical Engineering. During his degree, he has decided that he is less interested in technical issues and would prefer a career in business management. He believes he may need to obtain a further business-orientated qualification, but is not quite sure what this should be. He therefore answers an advertisement for an agency which will try to match his qualifications and aspirations to various professional courses which are available.

The agency is a franchise called Finditright Ltd. They send Patrick a form. He fills in his name, address, age, telephone number, grades and qualifications. He also answers a character-assessment questionnaire.

When Finditright Ltd. receives the information, they enter it into a database which is transferred to another company called Jobassessors Ltd. Jobassessor Ltd. processes the data and, by matching the information with a data-base on taught programmes in the UK, comes up with a series of course recommendations. These are returned to Patrick by Finditright Ltd.

Explain why and how the Data Protection Act 1998 applies to the above situation. In your answer you should carefully explain the following points:

(i) The objective of the Act. **(2)**

(ii) The processes by which the Act is implemented. **(1)**

(iii) The obligations that the Act places on Finditright Ltd. **(3)**

(iv) The obligations that the Act places on Jobassessor Ltd. **(3)**

(v) The rights that Patrick McGregor has under the Act. **(5)**

2.

a. Discuss the advantages and disadvantages of owning, maintaining and defending a patent. **(3)**

b. Describe the main sections of a patent specification. **(3)**

c. Outline the application process for a UK patent. **(3)**

d. Three EEE Undergraduates - John, Angela and Ivan – who are about to graduate, have an idea for a new energy saving device while they are chatting over lunch in the Students' Union. Between them they make rough drawings and notes for various designs for the device. The next day Ivan collects together their various jottings and writes it up into a formal patent application, which he intends to submit to the Patent Office in his own name.

Discuss the legal and professional issues involved with Ivan claiming ownership of the intellectual property in this situation. **(3)**

e. In fact, Ivan decides to tell Angela and John about the patent, and includes their names on the application. All three of them decide to go into business together when they leave University to try to make money out of their new invention.

Outline the main business strategies for the three friends, assuming that their patent is awarded and is likely to be a commercial success. **(3)**

f. In moving ahead with their plans, the friends are not sure whether they should form a partnership or a company. Discuss the relative advantages and disadvantages of these two different arrangements in view of their available business strategies. You should consider matters such as the ease and need of raising capital, cost and flexibility. **(5)**

3.

KM Fume Sensors (KMFS) is a small start up company which develops, manufactures and sells bespoke electronic devices and systems associated with the detection and removal of dangerous chemical fumes. Its principal product is called the "Detectonose". This is designed to be used in industrial and research environments in which there is a risk of chemical fumes leaking into the working environment.

The system consists of series of wall- and ceiling-mounted detectors connected to a central monitoring system. If fumes are detected, warning lights and evacuation sirens are set off, actuators on safety doors automatically seal off the affected area and extractor fans are switched on.

Each installation of the "Detectonose" system is uniquely designed to fit into the particular working environment in which it will operate. A large part of KMFS' revenue comes from the consultancy it supplies in order to settle on the most appropriate design of a particular system in view of the customer's needs.

a. KMFS and nearly all of its clients have ISO9000 certification. This requires KMFS to do various things and maintain certain records of how it executes these various activities. Briefly describe examples of ***five*** such activities or documents that might be relevant to KMFS in relation to ISO9000. **(5)**

b. The term 'total quality management' is nowadays used to describe rather broad aspects of the way an organisation runs itself, outside formal quality systems such as ISO9000. Give three examples of the sort of issues or activities that may form part of a broader quality system in a company such as KMFS. **(3)**

c. Give four examples of activities at KMFS which are likely to be subject to Health and Safety law. **(4)**

d. Suppose you are newly employed by KMFS as Chief Engineer. On your first day at work you are asked by the Managing Director to take on the role of Health and Safety Officer. Whilst KMFS supplies equipment which is an integral part of their clients' compliance with Health and Safety law, you discover that KMFS has not itself established any sort of health and safety management structure for its own premises and activities. Describe briefly what the law broadly would require you to do in order to make KMFS compliant with Health and Safety legislation. **(8)**

4.

a. When he was an EEE undergraduate, Karl Moran did not bother to turn up to any of the lectures on 'Professional Issues'. When he graduated from university, he joined a small company 'Aeroacts' where he was employed to design actuators for the aerospace industry. After about four years, it occurs to him it might be important to become a Chartered Engineer. Karl applies to the IET. He assumes that because he has MEng degree from the University of Sheffield, he will automatically be able to become Chartered Engineer. In fact, he discovers he must provide evidence of his continuing professional development.

(i) Give three examples of the type of activities that would count as '*continuing development*' in this context. **(3)**

(ii) What processes will Karl have to undergo to become Chartered? **(2)**

(iii) Give some indication of how Karl would persuade the IET that he had accomplished this development? **(2)**

b. After a few years Karl becomes a Chartered Electrical Engineer and decides to leave 'Aeroacts' to start work as an independent consultant. He is approached by a small company called 'Aircraft Doors Ltd.' (ADL) which designs and builds the passenger and cargo hold doors for aircraft.

ADL are designing a new type of door which is much lighter and can be opened much more quickly than a normal aircraft door. When the door is closed a control system is used to activate locking actuators to prevent the doors opening when the aircraft is in flight.

ADL have asked Karl to design the locking actuators and the control system. They tell him that they have drawn up a contract which specifies the system and describes what they expect Karl to do. The contract has certain sections.

For each heading listed below, describe what you think Karl would be expect to find under this section of the contract:

(i) Definitions **(2)**

(ii) Assignments **(2)**

(iii) Termination **(2)**

(iv) Confidentiality **(2)**

c. When he finally receives the contract, Karl is not happy. He imagines that if he designs the control system with a fault in it which he does not notice, and as a result a door on an aircraft opens during a flight and many people get injured or killed as a result of the failure of the control system, he might be held responsible. Comment on the legal and professional position of Karl. **(3)**

d. If you were advising Karl, what other precautions would you suggest that he should take under these circumstances? **(2)**

KM / PIR