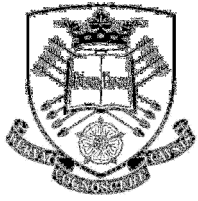


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The
University
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DEPARTMENT OF ELECTRONIC AND ELECTRICAL ENGINEERING

Spring Semester 2010-2011 (2 hours)

EEE222 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. Describe under what circumstances a company is required by law to undertake a risk analysis for the purposes of the health safety of its employees. (2)
- b. Give an example of a circumstance in which people who are not employees of a company should also be considered under a risk analysis of potential health and safety issues. (1)
- c. Describe the main components of a risk assessment exercise. (3)
- d. If you were acting as the Health and Safety officer of a small company, what other legal obligations are you required to undertake after you have identified a possible source of risk? (4)

After graduating with a degree in Electrical Engineering, Simon Sparks joins a maintenance company responsible for repairing, overhauling and testing high-voltage equipment. As part of his training, he is required to work in a variety of sections of the company in order to get an understanding of the technical side of the business. His manager is responsible for setting up this part of his induction. For three weeks Simon is required to work with a small group of technicians who are responsible for visiting electrical substations and repairing transformers.

The first job he attends with three other colleagues. It is an emergency repair of a faulty transformer which has failed and deprived a large area of a town of its electrical supply. Simon has been given a lengthy safety manual by his manager. One section of it explains that before entering an electrical substation, the group team leader must confirm with the central control headquarters, via mobile phone, that the electrical supply to the whole substation has been turned off. In fact, the team leader does not appear to make any such telephone call. The team leader unlocks the gates to the substation and as he does so he says to Simon *“Be careful, much of the equipment is live, so I wouldn’t touch anything if I was you!”*

- e. Do you think Simon should say anything to the team leader about the safety manual? Apart from caring about his own safety, do you think Simon has any legal duty to challenge the team leader’s behaviour? (2)
- f. If Simon complies with the team leader, and then two weeks later decides that he should have said something about the situation, what do you think his next steps should be? (4)
- g. If Simon says nothing at all about the incident to anyone in the company because he is scared of losing his new job, what do you think his legal and/or moral position would be if another member of the works team is killed or seriously injured while they are repairing a transformer? What would be the legal and/or professional situation of his immediate manager? (4)

2.

- a. Mr. North is the senior engineer for a small electronics company, SENSUS, who design domestic alarm sensors. Six company engineers design the alarm sensors and an external company is used to manufacture them for SENSUS' clients. One of SENSUS' regular clients is AHOY, a company who produce alarm systems.

For the 3 scenarios which appear below discuss which of the IET Rules of Conduct would apply in each case:

- (i) SENSUS is struggling to find customers and is struggling financially. Mr. North is worried that the company may fail and he will lose his job. He hears that AHOY are looking for a battery designer to design some custom batteries for inclusion in their systems. Mr. North offers to design the batteries for AHOY despite the fact that neither he, nor any of the engineers working under him, have experience of designing batteries. He tells AHOY that he does have experience in the area and as a result SENSUS are given the contract to design a compact battery for AHOY. During the design process, the engineers, whom Mr. North supervises, ask various questions about the design of the batteries and Mr. North tells them to make intelligent guesses. (4)
 - (ii) SENSUS employs an external company to manufacture the batteries they have designed. When the batteries are tested none of them work and they all have to be disposed of. Mr. South, one of the SENSUS company engineers working under Mr North's guidance, mentions to Mr. North that the batteries contain a toxic chemical and that they will need to be disposed of responsibly. This will be expensive, so Mr. North decides to dump the batteries in another company's waste bin on his way home. Mr. North told Mr. South of his intentions to dispose of the batteries, but Mr. South raised no objections. (6)
 - (iii) Mr. South was unhappy in his job, particularly as he was being asked to do a task he was not qualified to do. He decided to leave SENSUS and join a rival company. He was annoyed with Mr. North and wanted to teach him, and SENSUS, a lesson, so before he left he made photocopies of all the sensor designs the company had produced. He gave these designs to his new employer with the intention of poaching customers from SENSUS. (4)
- b. Jane West obtained an MEng degree from the University of Sheffield and joins a small engineering company. After about four years she decides it would be beneficial to become a Chartered Engineer. Jane applies to the IET and discovers she must provide evidence of her 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 Jane have to undergo to become Chartered? (2)
 - (iii) Give some indication of how Jane would persuade the IET that she had accomplished this development. (1)

3.

- a.** For each of the following areas of law, give an example of a situation which could lead to a company that manufactures electronic devices suing another company for damages in a court of law:

- (i)** Patent law. (2)
- (ii)** Copyright law. (2)
- (iii)** The law of passing off. (2)

- b.** Mark Brown works for a company, Luminus Ltd., which manufactures advanced light fittings and lighting control devices for use in domestic and commercial environments. Typical products include daylight-sensitive switches, outdoor lighting products, low-voltage lighting, fibre-optic arrays of ceiling lights and controllable coloured lighting systems. The company is small, only employing about 50 people.

Mark's official job title is Chief Engineer; he spends most of his time supervising and managing the various small-scale production lines.

While he is at work, he has an idea for a new type of low voltage light fitting which could be manufactured much more quickly and cheaply than existing models.

In this situation, who is the most likely owner of the intellectual property relating to the new light fitting? Explain your reasoning. (2)

- c.** While he is feeling bored one day at work, Mark thinks up a way of making a new type of cigarette that would reduce how much tar a smoker inhales.

In this situation, who is the mostly likely owner of the intellectual property relating to the new type of cigarette? Explain your reasoning. Consider also circumstances that might make it less clear who is the owner of this intellectual property. (4)

- d.** Suppose Luminus Ltd. agrees for Mark to work half a day a week at his own expense to make money out of his cigarette idea. What would you advise Mark to do in order to successfully exploit his idea? You should consider how he should legally protect his idea, what commercial options are available to him, and which of these options is tenable in the circumstances. (8)

4.

GreenSeats is a small company which manufactures various items of garden furniture such as garden chairs, tables, swings and sun loungers. GreenSeats contracts a software house to produce a custom written software system to aid them in assessing new designs for their products. The purpose of the software is to model mathematically the stresses and strains on various parts of the items of furniture to ensure that they will be safe under normal conditions of use.

- a. The contract between the GreenSeats and the software house includes terms relating to the six items in the following list. State and explain the purpose of each of these contract terms, and also any specific issues that the GreenSeats should consider.

- (i) Definitions (2)
- (ii) Software Specification (2)
- (iii) Liquidated Damages (2)
- (iv) Escrow (2)
- (v) Confidentiality (2)
- (vi) Maintenance (2)

- b. Six months after the software was installed, a garden table sold by GreenSeats to a customer, Mr Tree, collapsed. Miss Flower, a friend of Mr Tree, who was sitting near the table at the time, had her foot severely crushed.

GreenSeats heard about the accident and investigated the cause. They were concerned because the design of the garden table that collapsed had been tested using the new software. GreenSeats had no reason to believe that Mr Tree's use of the table was in any way out of the ordinary. They discovered that the software was so full of errors that to correct them would involve a complete re-write of the software. It was also discovered that the software house had employed a team of very inexperienced programmers to write the software.

Describe the most effective ways in which the law could be used to compensate the following parties. You should include all relevant issues in your answers.

- (i) Miss Flower (4)
- (ii) GreenSeats (4)

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