

OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAMINATIONS 2000/2001

MSc OCCUPATIONAL HEALTH & ERGONOMICS

SAFETY AND RISK MANAGEMENT (IE 522)

Dr. C. Hartley
Prof. M.E.J. O'Kelly
Mr. E. Fallon
Ms. M Kelly

Time Allowed: 3 hours

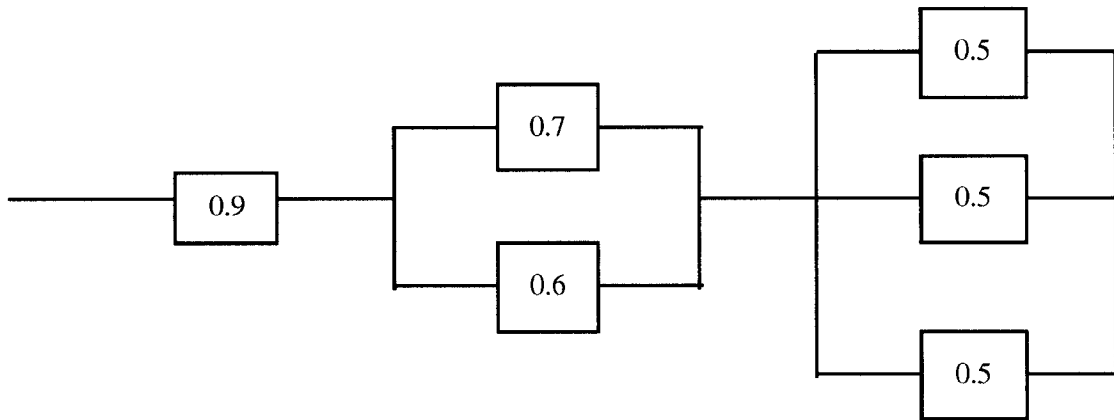
Answer any 5 questions

Use separate answer books for Section A and Section B

Section A

- | | Marks |
|---|--------------|
| Q.1 Write short notes on four of the following: | (5x4) |
| <ul style="list-style-type: none">(a) Safety in excavation(b) HAZOP(c) FMEA(d) Electrical Safety(e) Job Hazard/Safety Analysis(f) Hazards and risks associated with lifting equipment | |
| Q.2 Define the term "Safety Management Systems" and give examples of the principles that underlie effective management. | (20) |
| Q.3 (a) Explain what legislation the Health & Safety Authority has had to introduce to enable Ireland to become a contracting party to the ADR Agreement on the Carriage of Dangerous Goods by Road. Comment on the suitability of previous legislation. | (10) |
| (b) Indicate the main responsibilities of the 3 main players (i.e. consignors, carriers and drivers) identified as having duties under the new legislation. | (10) |

- Q.4 (a)** Determine the reliability of the system as shown in the following Reliability Block Diagram:



Each element has a constant reliability as shown in the diagram.

(6)

- (b) The load on and strength of a system is given by the data below:

Load	Probability	Strength	Probability
20	0.2	10	0.15
30	0.3	20	0.15
40	0.3	30	0.15
50	0.2	40	0.15
		60	0.25

- (i) Determine analytically the probability that the system will not fail (i.e. the load on the system is less than or equal to the strength of the system).

(6)

- (ii) Explain how the probability that the system will not fail may be estimated by simulation using the Monte Carlo method.

(8)

- Q.5** "The System Safety process incorporates the concept of people, procedures, facility, and/or equipment that must operate within a specific work environment to accomplish a task or set of tasks" (Vincoli, 1993). Discuss this statement.

(20)

Q.6 According to Health & Safety Authority statistics for 1999, falls from a height are the second largest category of non-fatal accidents in most Irish work sectors (11%) and the single largest category of construction fatalities (50%).

(a) What role has Safety Management to play in tackling this problem. (10)

(b) With particular reference to scaffolding, detail a scaffolding safety management programme. (10)

Q.7 (a) Describe an effective accident investigation and reporting procedure. (10)

(b) Discuss how accident causation theories might guide you in your investigation. (10)

Section B

Q.8 Under regulation 3(1) of the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 1994, it is the duty of the employer to ensure, that the exposure of his employees to chemical agents at work is prevented or, where the exposure cannot be avoided, adequately controlled. Describe and briefly explain possible operational and organisational control measures. (12)

Discuss the use of personal protective equipment in a chemical laboratory. (8)