

SCHOOL OF GEOINFORMATICS PLANNING AND BUILDING
CONSTRUCTION AND FIRE ENGINEERING 1N—FIRE COMPONENT
(FIRE TECHNOLOGY 1 – Internal Examination)

FIRST SEMESTER 2002

Date of examination:

Examiner: **Graham Brown**

General instructions to candidates :

Write your name on the examination booklet.

You must answer all questions.

All questions have marks indicated in brackets e.g. (20 marks)

Maximum marks : 100.

Lecture notes and text books and Australian Standards are permitted references.

Reading time is 10 minutes before commencing the paper.

Time for examination is 2 hours.

Question 1.

It is often said that most people who die in building fires do so because of the inhalation of carbon monoxide.

Explain how carbon monoxide is produced in a building fire and the effects that it has on the human body. **(10 marks)**

- (b) List the other products of combustion in building fires and explain the effects of these on the occupants and fire fighters. **(10 marks)**

Question 2

- (a) The process of combustion depends on several factors.

Explain how these are inter related and how a material will ignite and burn when they are all present. **(10 marks)**

- (b) A fire in a storage warehouse will burn longer than a fire in a house.

Explain why this is so and why the heat given off is so much greater from the warehouse than the house. **(10 marks)**

Question 3

Thoughtful use of walls and partitions made from ordinary building materials can help a building to resist the spread of fire for some time.

Discuss this statement and indicate how you would use ordinary building materials and components to restrict the spread of fire in a large building of two storeys with long corridors and used as a backpackers hostel. **(10 marks)**

Question 4

- (a) If a 100mm thick reinforced concrete floor slab spanned 4 metres by 4 metres and it was required to have a FRL of 120/120/120 and the Standard Fire Test using modelling techniques gave the following results, what could you conclude about the floor and what might you recommend to your client ?

Results:

Structural deflection at 120 minutes = 75 mm

Rate of deflection = 10 mm/min

Non fire side average temperature = 130 degrees K above ambient after 120 minutes

No cracks or fissures evident at 120 minutes. **(10 marks)**

- (a) A window having a fire resistance level of - / 60 / - is installed in a masonry wall between rooms in an office building.

If a fire started in one of these rooms would the fire be prevented from spreading to the next room for the full 60 minutes ? If not why not ? **(5 marks)**

Question 5

A prominent Architect was heard to say “ If I fit fire doors to the fire resisting stairs and fire doors on the lift shafts my six storey office building will be perfectly safe in a fire situation.”

Discuss whether you think this statement is valid or not. **(20 marks)**

Question 6

Access for people with disabilities is required to multi-storey buildings.

- (a) What provisions does the Building Code of Australia contain to enable these people to escape in the event of a fire in such a building ? **(5 marks)**
- (b) Discuss ways by which you could ensure reasonable safety for such people in the event of a fire in a high rise building and suggest how they could be evacuated from the building. **(5 marks)**
- (c) what precautions would you consider to prevent the rapid spread of fire over the floors and walls in the paths of travel to the exits in a building where people with disabilities were present ? **(5 marks)**

End of paper.