

UNIVERSITY OF SOUTH AUSTRALIA
SCHOOL OF NATURAL AND BUILT ENVIRONMENTS

CONSTRUCTION AND FIRE ENGINEERING 1N—FIRE COMPONENT
(Internal Examination)

FIRST SEMESTER 2005

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.

The examination is an “open book” examination and 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.

- (a) 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 present in building fires and discuss the effects that these can have on the occupants and fire fighters. **(10 marks)**

Question 2

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

Discuss how these factors are inter-related and how the removal of any of these can be used to extinguish a fire. **(10 marks)**
- (b) By means of diagrams explain the process of combustion in a piece of timber when it is subjected to heat and flames. **(10 marks)**

Question 3

- (a) By means of diagrams explain how a loadbearing brick wall would be tested to obtain its fire resistance level or FRL. **(15 marks)**
- (b) A window having a fire resistance level of - / 60 / - is installed in a masonry wall between compartments in an office building.

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

Question 4

- (a) A prominent Architect was once heard to say “If I fit fire doors to the fire resisting stair shafts and fire doors on the lift shafts in my six storey office building, the occupants will be able to escape from a fire in the building without any problems”.

Discuss whether you think this statement is valid or not and support your answer with reasons. **(10 marks)**

- (b) Discuss how radiation can play a major role in the spread of fire both between neighbouring buildings and up the facade of a building in which there is a fire. **(10 marks)**

Question 5

- (a) Discuss the features that should be considered when designing the escape routes in a building. **(10 marks)**
- (b) Modern building codes require that people with disabilities must have access to high rise buildings. Discuss ways by which you could ensure that people with disabilities would remain safe 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 take to prevent the rapid spread of fire and smoke in the paths of travel to the exits in a building where people with disabilities were present ? **(5 marks)**

End of questions.

