

SCHOOL OF NATURAL AND BUILT ENVIRONMENTS
CONSTRUCTION AND FIRE ENGINEERING 1N (CIVE 4009)
FIRE COMPONENT
FIRST SEMESTER 2004 (Internal Examination)

EXAMINATION: Internal Exam, Semester 1, 2004

DURATION: **2 Hours** of Exam time preceded by 10 minutes of reading time i.e. a total of **2Hrs 10 Mins**.
For **ENTEXT** students, 10 minutes of reading time plus 2Hrs & 20Mins of exam time i.e. a total of **2Hrs 30Mins**

EXAMINER: Graham Brown

REVIEWER: Assoc Professor George Zillante (Tel. 22379)

INSTRUCTIONS TO CANDIDATES:

- This exam is worth 50% of the fire component of the course
- You **MUST** answer all questions
- The value of each question is noted adjacent to the question
- Open Book Examination i.e. all references permitted

Question 1.

- (a) Discuss the reasons why the biggest danger to people and fire fighters in the event of a fire, is the smoke generated by the fire. **(10 marks)**
- (b) Discuss:
- the factors that must be present before a fire will start and continue to burn and **(5 marks)**
 - how fire fighters can use this knowledge to extinguish a fire or stop it from progressing. **(5 marks)**

Question 2.

- (a) Fire doors to fire isolated stairwells are tested in accordance with the Standard Fire Test and are assigned a fire resistance level or FRL. Discuss any deficiencies that can be present in such a door and any precautions you could take to improve its performance in a fire. **(10 marks)**
- (b) Steel framed fire windows can be limited in size because of expansion effects. Discuss how you could use alternate materials for the frame to achieve larger sizes without compromising the FRL required. **(10 marks)**

Questions continue on next page.

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- (c) A builder wants to use a new composite cement/plastic foam pellet block for load bearing building construction to provide a fire resistance level of 90/90/90 between apartments. Describe how the construction would be tested.
(5 marks)

Question 3

- (a) Escape from a building in the event of a fire is very important. Discuss the factors that have an effect on the evacuation process.
(10 marks)
- (b) Describe the method that you would recommend to ensure that a fire-isolated stair in a building having an effective height of 20 metres remained free of smoke. Explain why you think that this method is better than other methods that could be used.
(10 marks)

Question 4

- (a) Discuss the benefits of dividing a building into fire compartments.
(5 marks)
- (b) What factors determine the location of fire barriers?
(5 marks)

Question 5

Radiation and convection play a big part in the spread of fire in buildings.

Discuss the above statement as it would apply to a multi-storey building and explain the requirements needed to mitigate these effects and how effective they might be.
(15 marks)

Question 6

There are many methods of passive fire protection that can be used to control the spread of fire or smoke in a building. Of these, which do you consider to be the most important and why?
(10 marks)

End of questions

Total marks available is 100