



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

BUILDING CONSTRUCTION V

AAR 5102

Main Examination Paper

April 2015

This examination paper consists of 2 pages

Time Allowed: 4 hours

Total Marks: 100

Special Requirements: A1 sheets, masking tape, drawing boards, T- squares.

Examiner's Name: Mr T Nyamande

INSTRUCTIONS

1. Answer all questions
2. Marks will be awarded for neatly presented work.
3. Use appropriate scales for drawings. Use pencil or technical pen.

MARK ALLOCATION

QUESTION	MARKS
1.	40
2.	20
3.	25
4.	15
TOTAL	100

Question 1

- a. You are tasked to design a double-bay steel portal frame of an auction floor building measuring 48m x 24m x 4.5m height and has a basement for extra storage space. Draw a structural plan, elevation and section through the steel portal frame structure showing all relevant details which at appropriate scales. The details are to reflect the building components of the frame. [35]
- b. With the aid of detailed sketches, illustrate how you would protect the steel column from fire. [5]

Question 2

- a. By way of schematic sketches show how the same area can be covered using a space deck roof on a column grid of 12m x 12m stating the advantage and disadvantages from what you were tasked in Question 1. Explain with aid of sketches a section of the Space deck, units and connections of space deck unit to both external and internal columns. [15]
- b. State the difference between a girder and a space frame [5]

Question 3

- a. Compare and contrast the different walling systems (and materials) that can be adopted for framed buildings. Illustrate the options with sketches of technical fixing details. [20]
- b. From the walling systems stated above, recommend one that would suit the auction building giving reasons for your choice [5]

Question 4

- a. State three advantages and two disadvantages of either pre or post tensioned concrete over in-situ cast concrete. [5]
- b. Clearly discuss and illustrate the difference between pre and post tensioned concrete mentioning two uses of each. [10]