

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF THE BUILT ENVIRONMENT

DEPARTMENT OF ARCHITECTURE

BACHELOR OF ARCHITECTURE (HONOURS) DEGREE
2013-2014 ACADEMIC YEAR

PART V – FIRST SEMESTER SUPPLEMENTARY EXAMINATIONS – AUGUST
2014

BUILDING CONSTRUCTION V – AAR 5102

Instructions

Time: 4 hours

Answer all questions

Answer Question 1 on the A1 sheets provided.

Use pencil or technical pens only

QUESTION 1

Plan International, a non-governmental organization have decided to use 8 multi-span precast concrete portal frames instead of a steel portal frame for a warehouse in rural Wedza to store agricultural inputs for farmers. The concrete portal framed warehouse which measures 42 x 18m is brick clad on the bottom 1.5m. *A lightweight chromadeck cladding is on the upper part of the wall.* The warehouse internal clearance is 6m and is accessed by 2 roller shutter doors on one of the 18m wall.

a) Draw the Floor plan and two elevations of the warehouse using a scale of 1:100. (10)

b) (i) Draw a section through a concrete portal frame structure using a scale of 1:50 (8)

(ii) Provide details to reflect the building components of the frame using a scale of 1:5 (12)

c) State advantages and disadvantages for preferring the use of concrete portal frame against a steel portal frame. (5)

(d) Also suggest and illustrate ways of how the building can be provided with lighting and ventilation (5)

[40]

QUESTION 2

- a) (i) Explain the functional requirements of claddings. (5)
(ii) Give advantages of using precast cladding units. (2)
- b) (i) Define an infill panel and show typical details of infill panels using the following.
(Timber, metal or glass) (8)
(ii) Show a typical detail of an infill panel for sound, heat and moisture protection. (5)
- [20]**

QUESTION 3

- (a). What is pre-stressed concrete and identify its applications. (4)
- (b). Using well annotated sketches explain the methods of creating pre-stressed concrete systems. (8)
- (c). Give disadvantages of pre-stressed concrete and its advantages. (4)
- (d) Show using sketches the type of precast sections used to achieve pre-stressed Concrete structures (4)
- [20]**

QUESTION 4

Using well annotated sketches provide the following

- (a) A typical detail of a reinforced concrete north light barrel roof. (5)
- (b) A typical detail of the connection of space deck units to an internal Column (6)
- (c) Identify 2 membrane types used in tensile roofing structures (4)
- (d) State and explain the disadvantages of space frame systems (5)

