

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
FACULTY OF THE BUILT ENVIRONMENT

**DEPARTMENT OF ARCHITECTURE**

BACHELOR OF ARCHITECTURE (HONOURS) DEGREE  
2012-2013 ACADEMIC YEAR

PART III – FIRST SEMESTER EXAMINATIONS – JANUARY 2013

**PART III BUILDING CONSTRUCTION – AAR3108**

Instructions

*Time: 4 hours*

*Answer all questions*

*Answer question 1 on a single A1 sheet of paper provided.*

**QUESTION 1**

Mr Abubaker Ali Kamal a Qatari national recently purchased a piece of land in Mutare to construct a two storey building with a basement. The basement walls will be of brick with an internal tanking in mastic asphalt on a raft foundation. The structure is made up of 300mm brick cavity walls and has a concrete roof slab with a parapet wall. The clear height between floors will be 3m and distance between the outer walls is 9m.

Draw to an appropriate scale the section of the building from the basement through a door on ground floor and a window on the first floor to the concrete roof slab with a parapet wall clearly showing details of how dampness is prevented within the building.

Use a scale of 1:50 for the section and 1:5 for the details.

[40]

**QUESTION 2**

You have been commissioned to design a 15 storey office building in the city of Bulawayo. On the site of the new building exists a 7 storey building of reinforced concrete in a dilapidated state which is adjacent to two medium rise buildings. The works require that the existing structure be demolished to pave way for the new structure.

(a) Explain 5 factors that are considered before demolition works are done. (10)

(b) Explain 2 methods of demolition that can be employed. (10)

[20]

### **QUESTION 3**

- (a) (i) What is the difference between a displacement and a replacement pile? (4)
- (ii) Explain the function of the ground beam which sits on top of the piles. (2)
- (iii) Explain using sketches the application of the Friction pile and the Point bearing pile. (6)
- (b) (i) Explain the term underpinning and using sketches show any two methods that are used. (8)

**[20]**

### **QUESTION 4**

- (a) The construction project which you are supervising (*in Question 2*) is within the CBD of the City of Bulawayo in a confined site. Some of the building materials would need lifting with a crane.
- (b) Identify with justifications the type of crane to be used. (10)
- (c) Explain two forms of scaffolding that you know (4)
- (d) (i) How do you ensure the covering of scaffolds and the containment of working areas? (2)
- (ii) Why is the precaution measure you identified (*in Question d)( i)*) above necessary? (4)

**(20)**