UNIVERSITY OF JOHANNESBURG

PROGRAM : Bachelor of science in Construction (Bcon) Extended
ENGINEERING: BUILDING

SUBJECT : **DESCRIPTIVE QUANTIFICATION**

CODE : **DQUAED1**

DATE : NOVEMBER EXAMINATION
11 NOVEMBER 2019

DURATION : 180MIN

WEIGHT :40: 60

TOTAL MARKS :175

ASSESSOR : MR. BERENGER Y. RENAULT

MODERATOR : MURENDENI LIPHADZI

NUMBER OF PAGES : 23 PAGES INCLUDING THE COVER PAGE AND 1 ANNEXURE (15 Dimension papers for take-off) PLUS 1 EXAM ANSWER SHEET

INSTRUCTIONS : ANSWER ALL QUESTIONS.

REQUIREMENTS : WRITING MATERIALS.

INSTRUCTIONS TO CANDIDATES

- *SIGN AND DETACH ALL DRAWINGS, SCHEDULES AND HAND IN WITH FOLDERS*
- *The standard System and Model Bills are not allowed in the examination venue*
- *ALL work is to be measured STRICTLY in accordance with the latest edition of the "Standard System of Measuring Building Work".*
- *Scaling will not be allowed unless dimensions are not given and could not be calculated.*
- *Where dimensions are not given they should be calculated or measured from the drawings.*
- *Candidates are to assume their own specifications where workmanship and/or materials that are not mentioned.*
- *Work to be measured strictly in construction sequence.*
- *Candidates are to round off all recorded dimensions to 2 decimal places where applicable*
- *Squaring of dimensions is not required*
- *Use the answer/exam sheet provided to answer **QUESTION 1** and **3 ONLY**.*
- *Use the dimension papers/sheets provided to answer **QUESTION 2** and **4**.*

Question 1 - Standard System

How should the following items be measured according to the "*Standard System*"?

1.1 Excavations for trenches and holes (2)

1.2 Risk of collapse of excavations (5)

1.3 Carting away of excavated material (2)

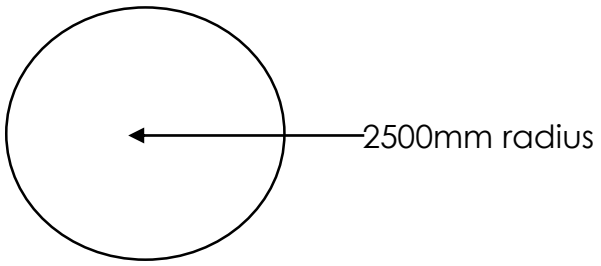
1.4 Keeping excavations free of water (1)

[10]

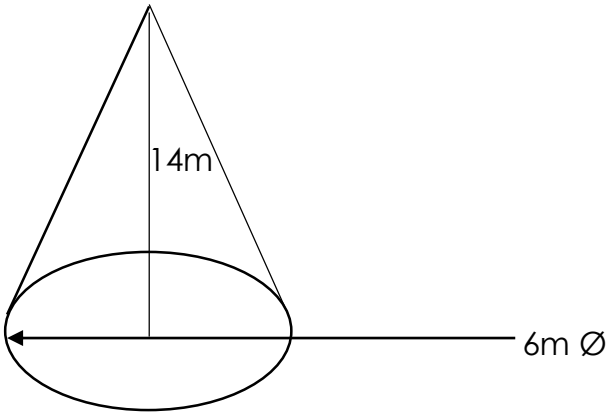
Question 2 -Reading and recording dimensions

2.1 Record the dimensions for the following objects onto the dimension paper provided. These **MUST** be recorded following the order: Length **X** Breadth/Width **X** Height/Depth, Length **X** Breadth/Width, or Length (as linear measurement). Do **NOT** Square the dimensions.

2.1.1 The circumference/perimeter of the circle with a 2500 mm radius. (1)



2.1.2 Volume of a cone with an 6m diameter and a vertical height of 14m.

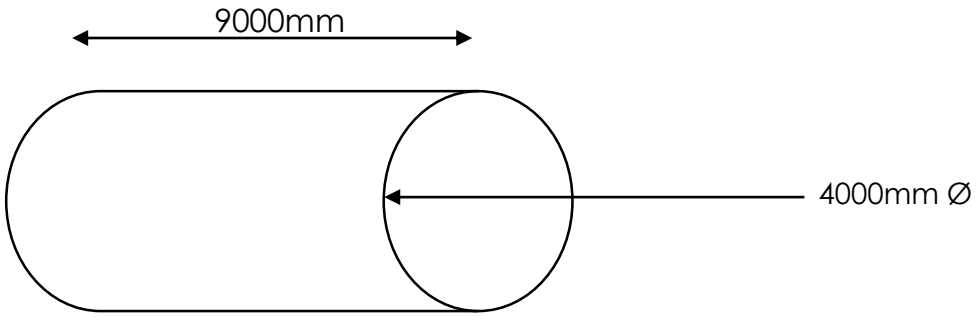


(3)

2.1.3

a) The volume of a cylinder with a 4000mm diameter and a length of 9000mm. (3)

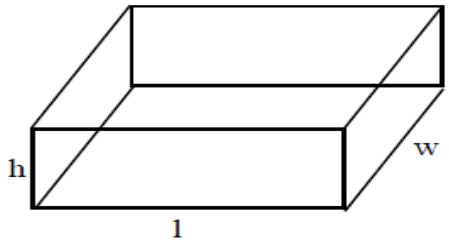
b) The Total surface area of a cylinder with 4000mm diameter and a length of 9000mm. (4)



2.1.4

a) The volume of the rectangular prism with length 6000mm, width 3000mm and height 1500mm. (3)

b) The total surface area of the rectangular prism with length 6000mm, width 3000mm and height 1500mm. (6)



[20]

QUESTION 3 - Mensuration

3.1 Anu wants to fence the garden in front of her house, on three sides with lengths 20m, 12m and 12m (Figure 1/Figure 12). Find the cost of fencing at the rate of R150 per metre. What will be the cost of grass, if per square meter grass costs R25? (4)

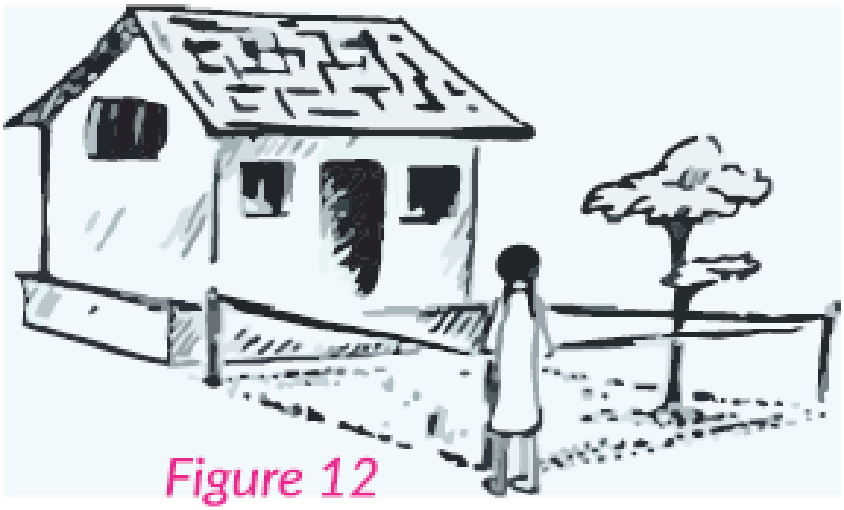


Figure 1

3.2 The internal measures of a room are 12m x 8m x 4m. Find the total cost of whitewashing all four walls of the room (including the ceiling), if the cost of whitewashing is R5 per m^2. Assume that there is a door of 2m x 1.5m size inside the room. (7)

3.3 An aquarium is in the form of a cuboid whose external measures are 80cm x 30cm x 40cm (Figure 2/Figure 22). The base, side faces, and back face are to be covered with a coloured paper. Find the area of the paper required. (4)

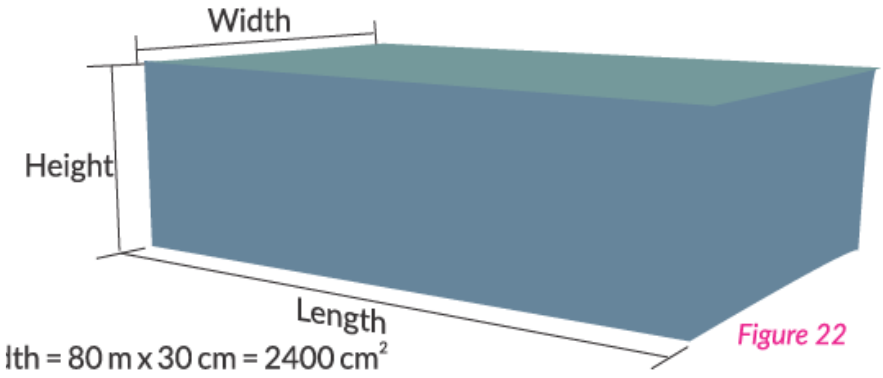


Figure 2

3.4 One 11cm long rectangular piece of paper (Figure 3) is folded without overlapping to make a cylinder of height 4cm. Find the volume of the cylinder. (5)

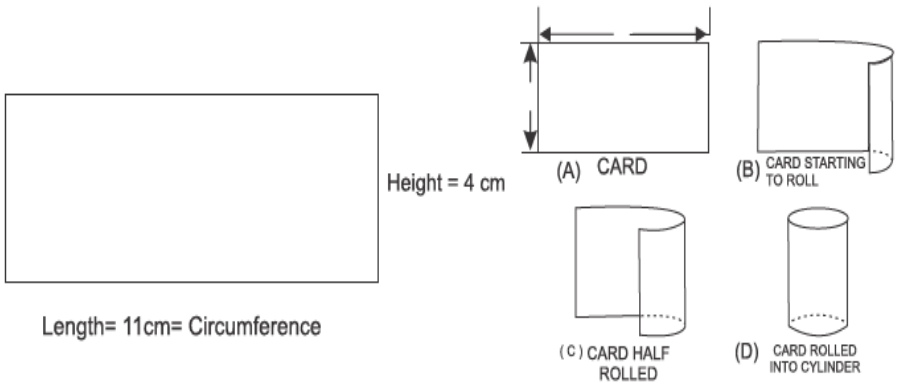


Figure 3

[20]

QUESTION 4 *– Descriptive Quantification*

Refer to drawing QS1A/NOV19 and demonstrate your ability to take off quantities for the following sections of work, all in accordance with the specification notes. DO NOT deduct the openings to doors and windows or any other openings

1. *Foundation collections* (6)
2. *Foundations/Substructure up to top of surface bed level* (102)
3. *Solid floor construction* (15)

[123]

SPECIFICATION NOTES

EARTHWORKS

- *Clear site to 1500mm beyond the building*
- *Stripping of topsoil is NOT required.*
- *Excavation is in ordinary earth*
- *Rock excavation: Soft rock depth 200 mm; Hard rock depth 150 mm.*
- *Backfill to foundations with excavated material in 150mm layers compacted to 80% Mod. AASHTO density*
- *Surplus excavated material to be carted off site*
- *25mm Thick clean river sand as sand blinding under floors*
- *100mm Filling under floors with clean filling material supplied by the Contractor*
- *150mm Hardcore filling under floors*

CONCRETE, FORMWORK AND REINFORCEMENT

- *Mass concrete 10MPa 1:3:6 (19mm stone) in concrete footings*
- *Mass concrete 10MPa (13mm stone) in filling to cavity of hollow wall*
- *Mass concrete 15MPa (13mm stone) in concrete surface bed*
- *Mass concrete blinding 15MPa 1:3:6 (19mm stone) under footings, 50mm thick*

MASONRY

- *All brickwork in concrete stock bricks in 1:4 cement mortar built in stretcher bond.*
- *Face bricks to external brickwork is Inca Brown Smooth face bricks with square recessed joints and pointed with 1:3 cement mortar. Allow two brick courses for face bricks in foundations*

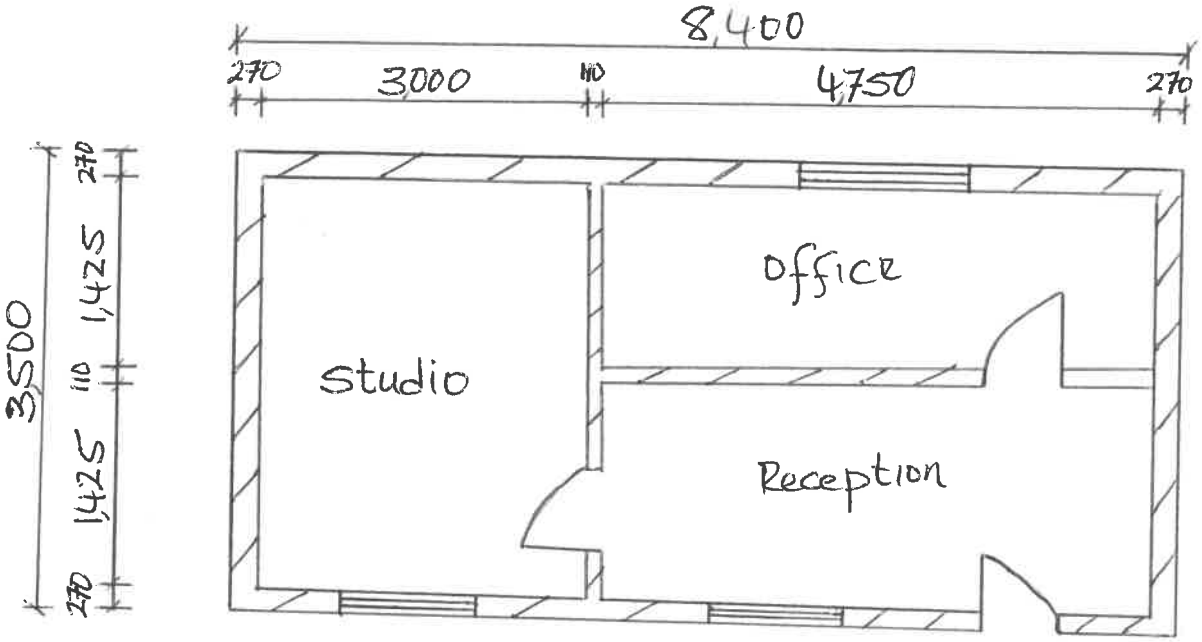
WATERPROOFING

- *375 Micron Gundle Gunplas DPC on walls.*
- *250 Micron Gundle Gunplas (SABS) DPM under floors with sealed laps.*

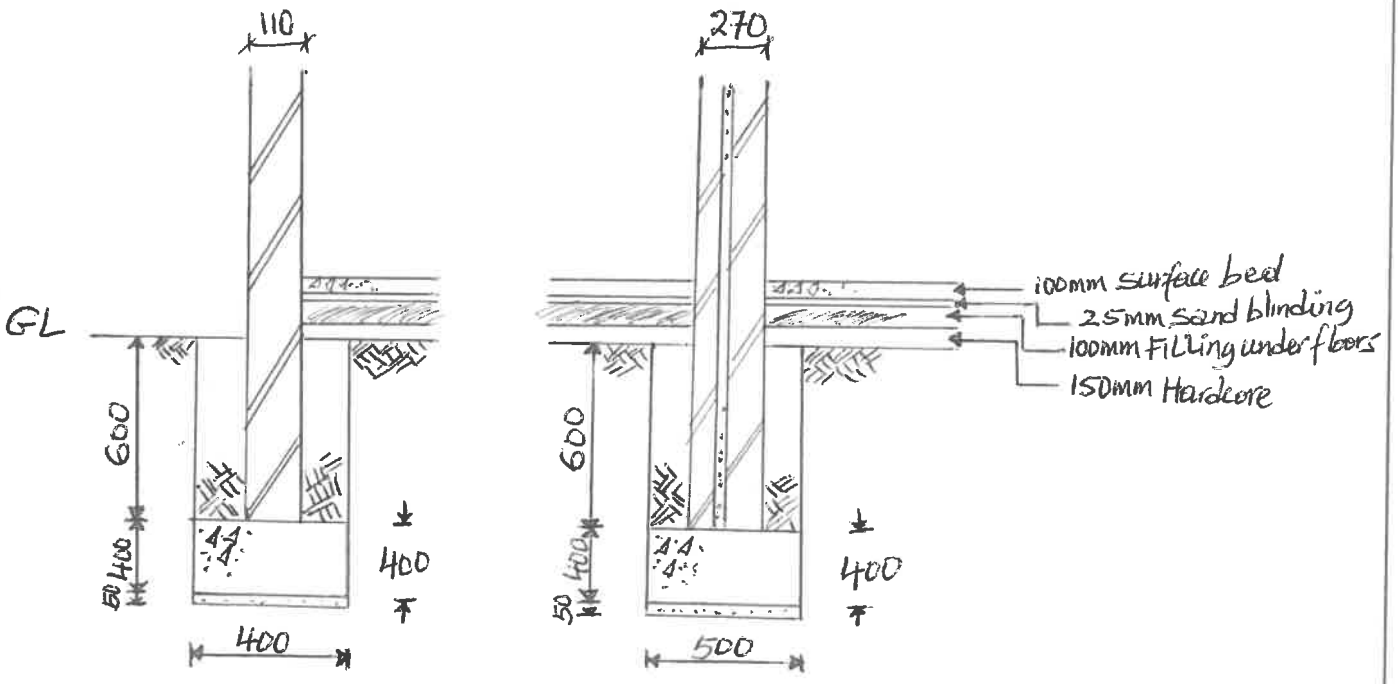
[173]

TOTAL MARKS [173+2]

Good luck!



Floor plan



Internal footings

External footings

Dwelling House for Ms Tshiane

Drawing No. QRS1A/NOV19

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Dimension paper

Student No.....

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