UNIVERSITY
OF
JOHANNESBURG

PROGRAM	:	NATIONAL DIPLOMA *BUILDING*
SUBJECT	:	**PRICE ANALYSIS AND ESTIMATING**
CODE	:	**PRAE331**
DATE	:	SUMMER SUPPLEMENTARY EXAMINATION JANUARY 2020
DURATION	:	3 HOURS
WEIGHT	:	40 : 60
TOTAL MARKS	:	100

ASSESSOR	:	LM NGWENYA
MODERATOR	:	B ILORI FILE NO
NUMBER OF PAGES	:	11 PAGES

INSTRUCTIONS	:	ONLY ONE POCKET CALCULATOR PER CANDIDATE MAY BE USED.
	:	ANSWER ALL QUESTIONS. ROUND OFF TO THREE DECIMAL PLACES
REQUIREMENTS	:	SUBMIT ANNEXURE A & B WITH THE ANSWER SHEET

QUESTION 1

Using the attached drawing A02 on page 11, calculate the following:

1.1.   Calculate the total area of the parking lot   **(8)**

1.2.   The number of paving blocks required for the parking lot, if 200mm x 100mm paving
        blocks are used.   **(4)**

1.2.   The length of fencing including the gate required to enclose the parking lot.

                                                                                               (2)

                                                                                               [14]

QUESTION 2

Rate Build-Up

2.1.   **Site Clearance**
        Item No. A:

        A grader clears 1200m2 a day at a cost of R600.00/hr. Build up a rate for site
        clearance assuming the following: Two 12m3 Tipper Truck costs R380/hr each and
        18000L Watercart costs R250/hr. The cost for the operator is R58.00/hr, and the
        spotter costs R18.00/hr.

                                                                                               (7)

2.2.   **Excavation**
        Item No. B:

        An excavator excavates 100m3 of soft material a day for foundations exceeding 6m
        but not exceeding 8m deep at a cost R600.00/hr. Build up a rate for excavation, given
        that the operator costs R58.00/hr, the Supervisor costs R68.00/hr and the spotter costs
        R18.00/hr.

                                                                                               (6)

2.3.   **Backfilling**
        Item No. C:

        A team of seven labourers' backfill and compact 60m3 a day. Build up a rate for
        backfilling assuming three semi-skilled labourers' costs R28.00/hr each to compact

and two semi-skilled labourers costs R28.00/hr each are used for rotation, the operator costs R58.00/hr and the spotter costs R18.00/hr. The TLB costs R380.00/hr, and the rammer costs R330.00/day.

(6)

2.4   **Reinforcement**

Item No. D:

A team of four steel fixers fix 55m2 of mesh wire in a day. Build up a rate for steel fixing, assuming that four skilled (steel fixers) labourers costs R38.00/hr each and a section leader costs R48.00. The price for 4800mm x 2400mm mesh wire costs R1500.00.

(8)

2.5.   **Concrete**

Item No. E:

A concrete team of eight labourers place 10m3 of concrete to surface bed per day. The cost of 1m3 20MPa ready mix concrete is R1300.00 and a poker vibrator is R320.00 a day. Four skilled labourers for placing costs R40.00/hr each and two unskilled for vibrating costs R20.00/hr each and two unskilled for finishing cots R20.00/hr eac.

(7)

2.6.   **Half Brick wall**

Item No. F:

A team of bricklayers' lay 600 bricks per day in a half brick wall. Build up the rate per m2 for a half brick wall, given that one skilled labourer costs R38.00/hr, one semi-skilled costs R28.00/hr and one unskilled costs R18.00/hr.

(11)

2.7.   **Mortar Mixing**

A mortar mixing team of two labourers' mixes a 1m3 of a 1:4 mix ratio of mortar in 3 hours. Build up a rate for mixing plaster on site, assuming that one skilled labourer costs R38.00/hr, and semi-skilled costs R28.00/hr.

(7)

2.8. **Door Frame**

Item No. G:

A team of two labourers sets up one doorframe in half an hour. Build up a rate per no. to set up a doorframe. Assuming one skilled labourer costs R38.00/hr and, one unskilled costs R18.00/hr. Allow for 8 profiles.

(5)

2.9. **Doors**

Item No. H:

A team of two labourers hangs 15 doors a day. Build up a rate per no. to hang a door given that one skilled labourer costs R38.00/hr and, one unskilled costs R18.00/hr.

(5)

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APPENDIX A: BILL OF QUANTITIES

Initials and Surname…………………………………Student No……………………

Item No.	Description	Unit	Qty	Rate	Amount
BILL NO 1					
EARTHWORKS					
A	SITE CLEARANCE Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc. and trees not exceeding 200mm girth	m2	10 000		R
B	EXCAVATION Exceeding 6m deep but not exceeding 8m deep	m3	5 000		R
C	FILLING ETC. Backfilling from excavated material in stages not exceeding 150mm, compacted to 95% Mod AASHTO	m3	1 000		R
			Amount Carried forward		**R**
			Amount Brought forward		**R**
BILL NO 2					
REINFORCEMENT					
D	Mesh Wire	m2	70		R
			Amount Carried forward		**R**
			Amount Brought forward		**R**
BILL NO 3					

CONCRETE					
E	20MPa Concrete	m3	65		R
		Amount Carried forward			R
		Amount Brought forward			R
BILL NO 4					
BRICKWORK					
F	Half Brick wall in Substructure	m2	50		R
		Amount Carried forward			R
		Amount Brought forward			R
BILL NO 5					
DOORS					
G	DOOR FRAME Steel Door Frame	No	12		R
H	PANEL DOOR 813 mm x 2032 mm Two panel Door	No	12		R
		Amount Carried forward			R
		Amount Brought forward			R

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APPENDIX B: SUMMARY PAGE

Initials and Surname………………………………….Student No……………………

BILL NO.	SUMMARY	AMOUNT
1	Earthworks	R
2	Reinforcement	R
3	Brickwork	R
4	Plastering	R
5	Doors	R
	TOTAL	

[6]

TOTAL = 100

Price Analysis and Estimating (PRAE331) Information sheet

Information to be used in answering the questions

CONSTANTS:

On costs   30%

Mark Up   10%

Waste   5%

Shift / Day   8 hrs

Labour Rates

Supervisor   R58.00

Operator   R48.00

Skilled   R38.00

Semi-skilled   R28.00

Unskilled   R18.00

EARTHWORKS

Excavation

4m – 6m deep excavation allow 65% for battering

6m – 8m deep excavation allow 70% for battering

Cart Away

Time to load tipper truck: 5 mins

Time taken too dump site: 6 mins

Time taken to tip at dump site: 3 mins

Time taken to return from dump site: 6 mins

Formula

Number of trucks required = (time to load + haul time) / time load

REINFORCEMENT

Waste	5%
Tying Wire & Spacers	3%
Laps	10%
Tying Wire	2%

CONCRETE

Waste	5%

BRICKWORK

Price of Ready-Mix mortar per m3 - R1150.00

Standard Stock Brick Size - 220mm x 110mm x 75mm

Price of a 1000 stock bricks - R2250.00

Price of a 1000 face bricks - R3250.00

Mortar Thickness - 10mm

Allow 50% of wastage for both mortar and bricks

Production

Stock Brick	600 bricks per day
Face Brick	450 bricks per day

PLASTERING

Use 30% compression factor, therefore 1.3

There are 33 litres in one bag of cement. Therefore 33l/1000=0.033m3

Bag of Cement – R90.00

m3 of Sand - R340.00

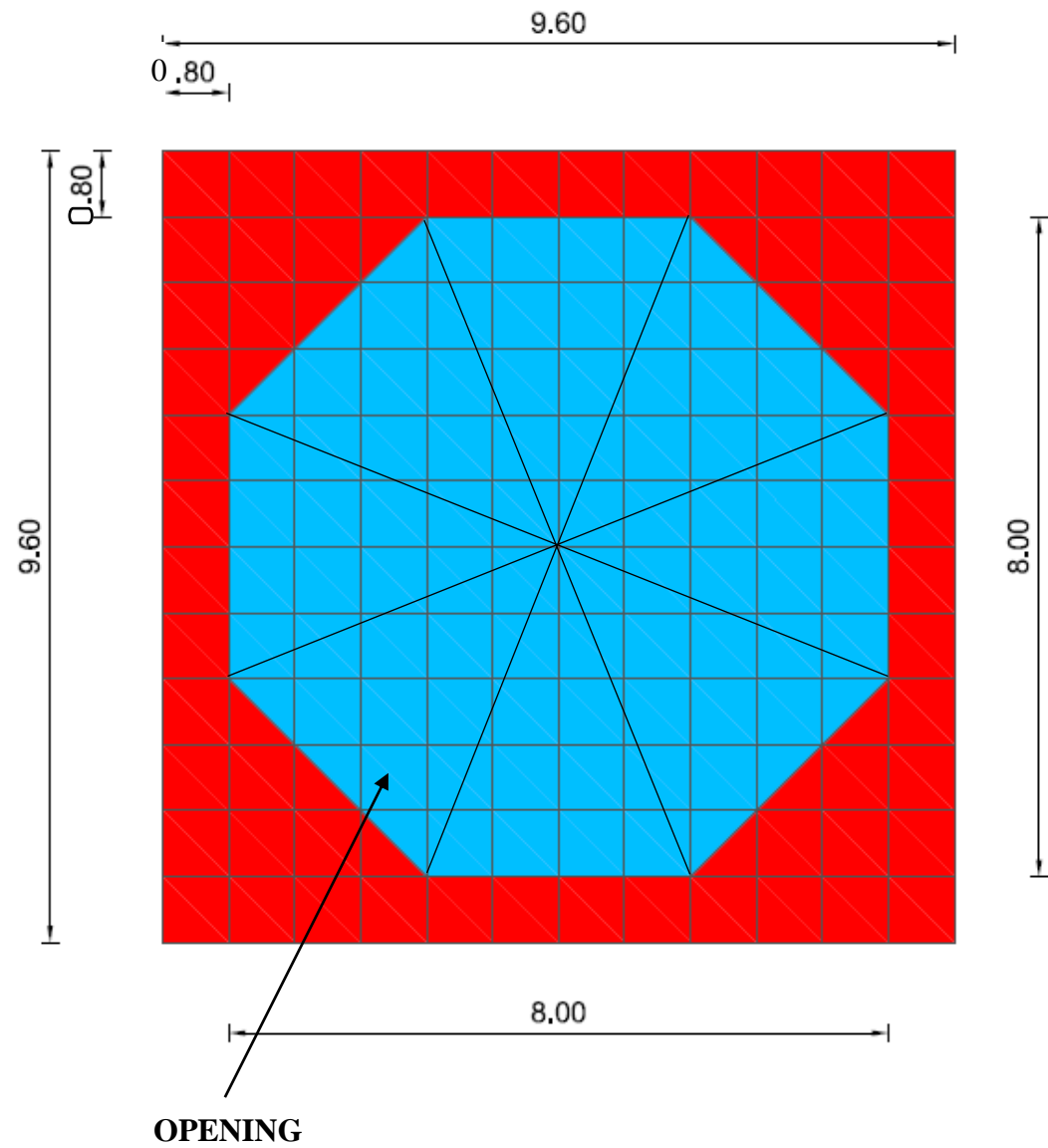|	
Waste for plaster mixing	5%
Waste for plastering	50%

Formula

Number of m2 in a m3 = m3 / plaster thickness

12mm plaster allow 19mm

19mm plaster allow 25mm

Mortar Rate: Use calculated Mortar Rate (from the mortar mixing)

DOORS

Door Frame	R550.00
Door	R410.00
Two lever Lockset	R125.00
8 x Profiles	R14.50 each

Drawing A02: Parking Lot
Note: the Octagon is an opening.