



**PROGRAM** : NATIONAL DIPLOMA  
*BUILDING*

**SUBJECT** : **PRICE ANALYSIS AND ESTIMATING**

**CODE** : **PRAE331**

**DATE** : SUMMER EXAMINATION  
NOVEMBER 2019

**DURATION** : 3 HOURS

**WEIGHT** : 40 : 60

**TOTAL MARKS** : 100

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**ASSESSOR** : LM NGWENYA

**MODERATOR** : B ILORI

**NUMBER OF PAGES** : 8 PAGES

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**INSTRUCTIONS** :

- : ONLY ONE POCKET CALCULATOR PER CANDIDATE MAY BE USED.
- : USE THE INFORMATION SHEET TO ANSWER ALL THE QUESTIONS.
- : ANSWER ALL QUESTIONS.
- : ROUND OFF TO THREE DECIMAL PLACES.

**REQUIREMENTS** : SUBMIT APPENDIX A & B WITH THE ANSWER BOOKLET

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**QUESTION 1**

Using the attached drawing A01, calculate the following:

- 1.1. Calculate the area of elliptical office. (4)
- 1.2. The number of tiles required, if 350mm x 350mm floor tiles are used. (4)
- 1.3. Perimeter of the office. (4)
- 1.4. Number of skirting required, if 3.6m long timber skirting is used. (3)

[15]

**QUESTION 2**

- 2.1. Highlight and discuss the nature of waste factors. (6)
- 2.2. Discuss the two types of equipment procurement. (6)
- 2.3. Outline the difference between general specifications and detailed specifications. (6)

[18]

**QUESTION 3**

**Rate Build Up**

3.1. **Excavation**

An excavator excavates 130m<sup>3</sup> of soft material a day for foundations exceeding 4m but not exceeding 6m deep at a cost R600.00/hr. Build up a rate for excavation, given that the operator costs R52.00/hr, the Supervisor costs R62.00/hr and the spotter costs R12.00/hr.

(6)

3.2. **Cart Away**

Build up a rate for carting away surplus material from site. Assuming a 12m<sup>3</sup> tipper truck costs R300.00/hr, a TLB costs R380.00/hr, the operator(s) costs R52.00/hr each and the spotter costs R12.00/hr.

(10)

**3.3. Reinforcement**

A team of four steel fixers fix 1.5 tons of steel in a day. Calculate the rate per kg for steel fixing, assuming that four skilled (steel fixers) labourers' costs R32.00/hr each and one section leader costs R42.00/hr. The price of steel per ton costs R11 500.00.

(8)

**3.4. Concrete Placing**

A concrete team of nine labourers' places 12m<sup>3</sup> of concrete to surface bed per day. Build up a rate for placing concrete assuming the cost of 1m<sup>3</sup> 20MPa ready mix concrete costs R1500.00 and a poker vibrator costs R300.00/day. One supervisor cost R62.00/hr, four skilled labourers for placing at R32.00/hr each and two unskilled for vibrating cost R12.00/hr each and two unskilled for finishing at R12.00/hr each.

(7)

**3.5. Face Brick**

A team of three bricklayers lay 450 bricks per day in a face brick wall. Build up a rate per m<sup>2</sup> to lay bricks in a face brickwall. Assuming, one skilled labourer costs 32.00/hr, one semi-skilled costs R22.00/hr and one unskilled costs R12.00/hr and one semi-skilled labourer does 30m<sup>2</sup> of jointing per day. The production for laying stock bricks is 600 bricks per day.

(22)

**3.6. Plaster Mixing**

A mortar mixing team of two labourers' mixes a 1m<sup>3</sup> 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 R32.00/hr, and semi-skilled costs R22.00/hr

(7)

**3.7. Plastering**

Using the previously calculated rate for plaster mixing, calculate the rate per m<sup>2</sup> for 19mm thick plaster in 1:4 mix ratio. Given that, a team of two labourers plasters 15m<sup>2</sup> per day to narrow widths not exceeding 300mm wide. One skilled labourer costs R32.00/hr and, one semi-skilled costs R22.00/hr.

(7)

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**TOTAL = 100**

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**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	R62.00
Operator	R52.00
Section Leader	R42.00
Skilled	R32.00
Semi-skilled	R22.00
Unskilled	R12.00

**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%
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### **BRICKWORK**

Price of Ready Mix mortar per m<sup>3</sup> - R1300.00

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

Price of a 1000 stock bricks – R1750.00

Price of a 1000 face bricks – R2750.00

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  $33/1000=0.033\text{m}^3$

Bag of Cement – R95.00

m<sup>3</sup> of Sand - R300.00

Waste for plaster mixing    5%

Waste for plastering        50%

### **Formula**

Number of m<sup>2</sup> in a m<sup>3</sup> = m<sup>3</sup> / plaster thickness

12mm plaster allow 19mm

19mm plaster allow 25mm

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

