



PROGRAM : NATIONAL DIPLOMA:
BUILDING

SUBJECT : **PRICE ANALYSIS AND ESTIMATING 3**

CODE : **PRAE 331**

DATE : SUMMER EXAMINATION 2016
30 NOVEMBER 2016

DURATION : (SESSION 1) 08:30 - 11:30

TOTAL MARKS : 100

EXAMINER : T NICHOLS / FC FESTER

MODERATOR : I BABASOLA

NUMBER OF PAGES : 6 PAGES

INSTRUCTIONS : ANSWER ALL THE QUESTIONS
USE THE INFORMATION SHEET ATTACHED

REQUIREMENTS : 1 ANSWER SCRIPT.

INSTRUCTIONS TO CANDIDATES:

PLEASE READ ALL THE QUESTIONS AND THE INFORMATION
BEFORE ATTEMPTING ANY QUESTIONS
USE THE INFORMATION SHEET TO ONLY ANSWER SECTION 1 OF
THIS EXAMINATION

PRICE ANALYSIS AND ESTIMATING (PRAE 331) - INFORMATION SHEET

INFORMATION TO BE USED IN THE ANSWERING OF THE QUESTIONS

Use the following Labour rates: *Artisan R60.00/hr all in*
Labourer R20.00/hr all in
Operator R35.00/hr all in
8 Hour days

PRELIMINARIES

Prices:

Electricity Connection plus usage. Units R1.65. Connection and deposit	= R3500.00
Water Connection plus usage. Per Kilolitre R8.00. Connection and deposit	= R900.00
Gate for entrance to site	= R10000.00
Fence from subcontractor per metre	= R15.00/m
The Insurance rate per R100 000.00 of construction is	= R100.00

CONCRETE, FORMWORK AND REINFORCEMENT

Specification:

All cement to be 32MPa

Concrete to surface bed with machine is 1:2:4

Concrete by machine: (When you mixing more than 25m³ of concrete in 1 item for academic purposes)

A 760/540 Concrete mixer delivers 540 litres of wet concrete per 3 minute cycle

A 750 litre dumper can take the entire load of concrete to where it is needed in one trip

A Dumper driver is an operator and so is the concrete mixer operator

5 labourers are needed on the surface bed for getting the concrete out of the dumper and levelling the concrete on a surface bed

9 Labourers are needed to fill the mixer in a 1:2:4 mix. 4 on Stone, 2 on sand and 3 on cement
(Hint) For placing of concrete and cost of labour at the machine, calculate the cost of labour per day and divide this by the total amount of concrete mixed per day

In mixing concrete by machine it is a maximum of 540 litres per cycle

Prices:

1 bag cement	= R65
1 m ³ River sand	= R350
1 m ³ 19mm Stone	= R400
Concrete Mixer	= R1300/day
Dumper	= R1100/day

MASONRY

Specification:

All bricks to be nominal size 115x230x75mm SABS approved stocks and red cement smooth face-brick

All brickwork to be in cement and building sand 1:5 mix

All cement to be 32MPa

Constants:

It takes 5 labour hours to mix 2 mortar for brickwork and plaster

A bricklayer and labourer lays 600 stock bricks per day

A bricklayer and labourer lays 450 face bricks per day

A labourer joints 30m² of face brick per hour

100ml of mortar is used to joint 1m² of face brick

Prices:

1 m³ Building sand

= R300

1000 Stock Bricks

= R1600

1000 Maize rustic Face Bricks

= R2900

METALWORK

Prices:

A 813 x 2032 x 1.2mm Pressed Steel Door Frame

= R300/each

NE 1 Window Frame

= R80.00

NC1 Window frame

= R120.00

NC2 Window frame

= R 180.00

ND11F Window Frame

= R550.00

PLASTERING

Specification:

All plaster to be in cement and plaster sand 1:5 mix

All screeds to be in cement and river sand 1:4 mix.

Allow 5mm more than the specified thickness for all plasters and screeds

Constants:

It takes 5 labour hours to mix 2 aggregate material

A Plasterer and 1 labourer does 30m² of plaster to walls in one day

A Plasterer and 1 labourer does 30m of plaster narrow width in one day

A Plasterer and 1 lab does 15m² of concrete soffits in 1 day

A Plaster and 1 labourer does 60m² of floor screed per day excluding mixing. Include the waste cost after the labour has been included

A labourer does 80m² in 1 day of brushing (not rolling) plasterkey/bond onto concrete vertical surfaces

A labourer does 60m² in 1 day of brushing (not rolling) plasterkey/bond onto concrete soffits surfaces

Brush lasts for 1000m² of smooth concrete surfaces

Allow 30% wastage on screeds

Plasterkey 10m² per litre

Prices:

1 bag cement

= R65

1 m³ Plaster sand

= R350

20 Litre Plasterkey

= R695

Brush

= R15

PAINTWORK

Constants:

An operator does 100m² of painting per day, walls and ceilings
Allow 8m² for the 1st coat and 7m² for 2nd coat.
Allow 1kg of polyfilla for 20m² of wall
Allow 1kg of polyfilla for 40m² of wall on ceilings
1 Labourer applies 15m² of Polyfilla to plaster in 1 hour
1 Labourer does 15m² of sanding Polyfilla to walls in 1 hour
1 Labourer applies 25m² of Polyfilla to ceilings in 1 hour
1 Labourer does 10m² of sanding Polyfilla to ceilings in 1 hour

Prices:

Plaster primer coverage at 6m ² per litre. 20 Litre drum	= R760/drum
Polyfilla 5kg	= R 70/ 5kg Box
100 Grit sandpaper 1 m long does 100m ² of sanding polyfilled plaster	= R20/1 m roll
Polyfilla 1kg does 100m ² of covering screws on ceilings	= R70/ 5kg Box
100 Grit sandpaper 1 m long does 300m ² of sanding polyfilled ceilings	= R20/1 m roll
20 Litre drum of PVA	= R650/drum

QUESTION 1

When bricks are to be laid, the estimator will allow 4 extra bricks for a 1 brick wall and 2 extra bricks for a half brick wall for waste. Using this information and allowing that a third of a brick takes up the space of 1 brick when dumped on a truck, calculate the cost of removing the waste off site if the cost of bricks loaded onto the truck and dumped is R140/m³. Then convert this to m² and add to the price of the brickwork.

- 1.1 What will the extra amount be for 300m² of 1/2 Brick wall (3)
 - 1.2 What will the extra amount be for 300m² of one Brick wall (3)
 - 1.3 What will the extra amount be for 300m² of one and 1/2 Brick wall? (3)
- [9]

QUESTION 2

Price the following brickwork, don't add in the price of carting away the waste:

- 2.1 Half brick wall in clay stock bricks (4)
 - 2.2 Extra over ordinary brickwork for face built in Maize Rustic Face bricks with weathered joints (6)
- [10]

QUESTION 3

Price the following Concrete work:

- 3 1:2:4 mix concrete to surface beds to a power-floated finish. Finish measured elsewhere. [8]

QUESTION 4

Price the following Paintwork:

- 4.1 3 Coat paint to smooth plaster finish (8)
 - 4.2 2 Coat paint to Gypsum Ceilings (4)
- [12]

QUESTION 5

Price the following Plaster work:

- 5 12mm 1 Coat cement plaster to walls (vertical brick) [5]

QUESTION 6

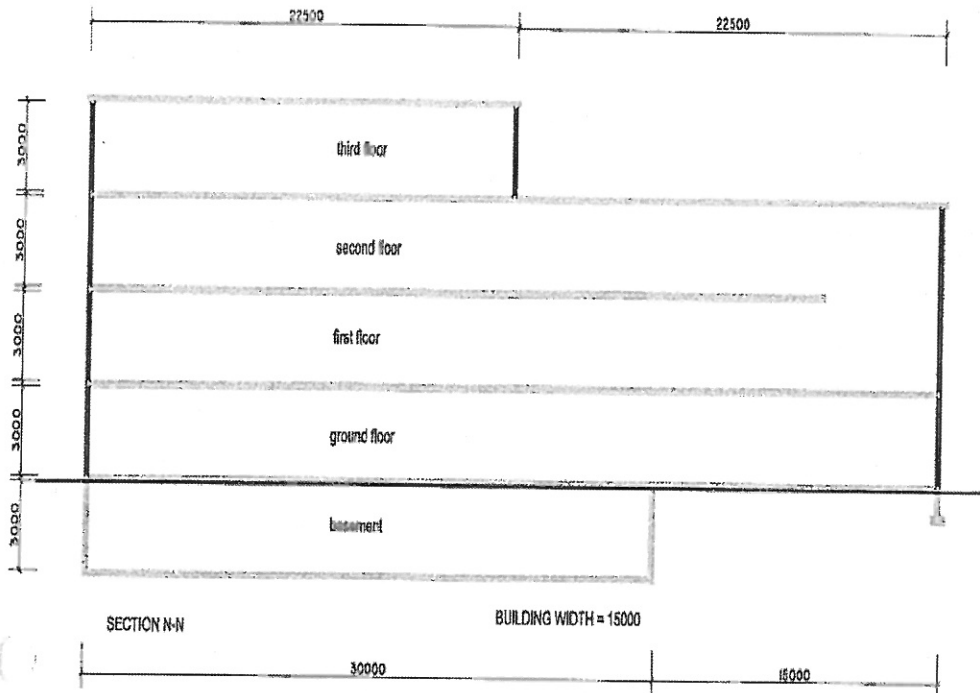
Price the following Metalwork

- 6.1 Set up a PSDF (3)
 - 6.2 Set up and NE 1 window frame (3)
- [6]

QUESTION 7

Calculate the cost per storey enclosed method. The cost of the building is R1 250 000.00. (Refer sketch B below):

[10]



QUESTION 8

Define the different types of :

[5]

- (a) Material waste
- (b) Labour waste
- (c) Plant waste

QUESTION 9

Price the following:

Ceiling and branderling – 6,5mm gypsum plasterboard ceiling nailed to and including branderling (38 x 38)

[10]

Factors for consideration:

- Branderling at 400 centres. Branderling is 38 x 38
- Clout nails at 150 centres
- Scaffolding and tools included in P&G e/w
- Use a basis of 12 m² and ceiling layout is 4000 long x 3000 wide
- H strips are to be used at board junctions
- Gypsum plasterboard costs R65 per m²
- Clout nails cost R7.00 per kg
- H strips cost R6.00 per m

- 38 x 38 Brandering costs R17.00 per meter
- Material waste is 7%
- 1 Artisan (R50.00 per hour) and 1 labourer (R19.50) fixes 30m of brandering per hour
- Same team erects one m² of ceiling per 20 minutes overheads at 3 %
- Profit @ 7%

QUESTION 10

Define the objectives of the Costing Department in a Construction Business. [5]

QUESTION 11

Calculate the all in labour rate. [10]

A contractor wishes to tender on a job approximately 120 km's away from office. Assuming that basic pay for Artisan is laid down for the area of contract is R15.85 per hour and working week is 40 hours calculate "all in" rate hourly cost of an Artisan taking into account the following:

Constituents per week:

1. Holiday pay	R52.00
2. Bonus	R24.00
3. Pension Fund (50% by employee)	R87.20
4. Medical Aid (50% by employee)	R38.40
5. Sick Benefit (R1.60 by employee)	R02.40
6. Stabilization fund (R0.80 by employee)	R00.80
7. Tool insurance (100% by employee)	R00.40
8. Industrial council levy	R05.20
9. MBA	R03.64

Assume that workers are transported to site on Monday mornings and collected on Friday afternoon each week (R140 per trip) and 15 Artisans are transported each time. A lodging allowance of R40 per day will be paid to each Artisan (5 days).

QUESTION 12

List all elements which are charged against the running cost of a piece of plant. [6]
Also differentiate between "owning" and operating costs.

QUESTION 13

Define and demonstrate "cycle time". [4]

[TOTAL = 100]