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NATIONAL SENIOR CERTIFICATE EXAMINATION  
NOVEMBER 2016

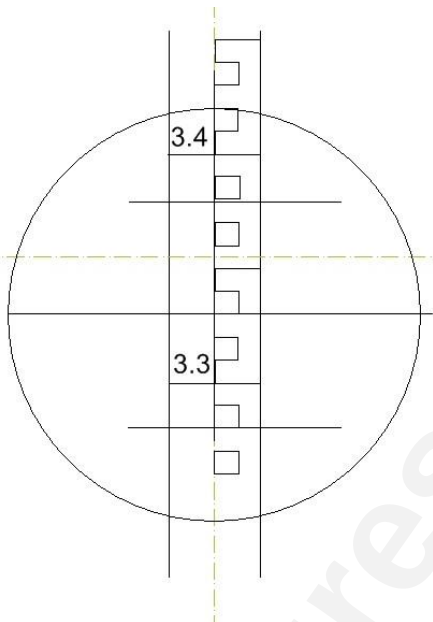
**CIVIL TECHNOLOGY**

**ANSWER BOOKLET – MARKING GUIDELINES**

Time: 3 hours

200 marks

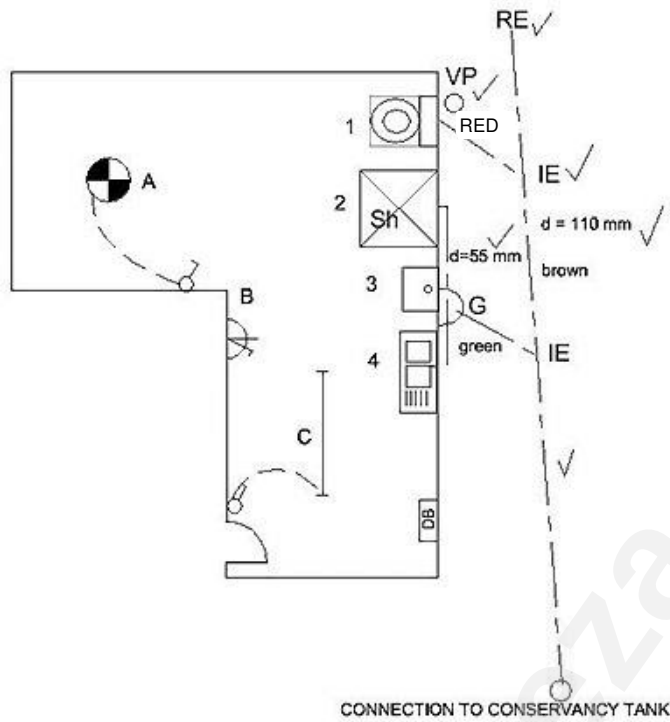
**QUESTION 2.4**



**\*Any other acceptable drawing**

| Assessment Criteria | Marks    | Mark obtained |
|---------------------|----------|---------------|
| Correctness         | 3        |               |
| Circle of eyepiece  | 1        |               |
| <b>TOTAL</b>        | <b>4</b> |               |

QUESTION 3.2



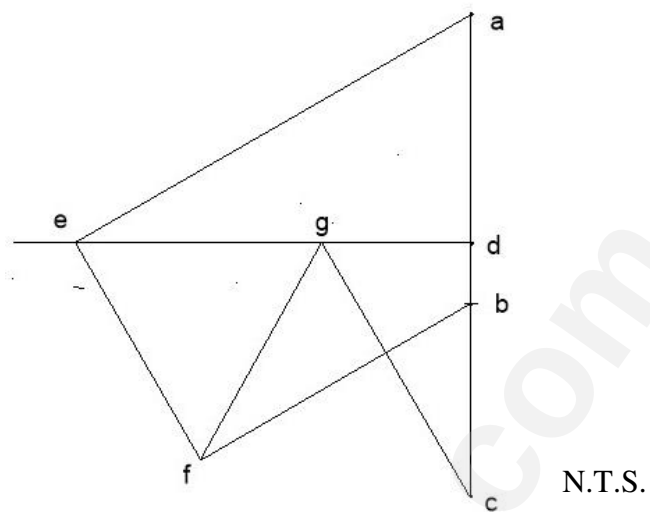
|       | Assessment Criteria              | Marks     | Mark obtained |
|-------|----------------------------------|-----------|---------------|
| 3.2.1 | Symbols for sanitary fittings    | 4         |               |
| 3.2.2 | Correctness of sewerage system   | 3         |               |
|       | Correct line type                | 1         |               |
|       | Any two abbreviations            | 2         |               |
|       | Colour code for ONE pipe         | 1         |               |
|       | Diameter of drain pipe indicated | 1         |               |
| 3.2.3 | Electrical symbols               | 3         |               |
|       | <b>TOTAL</b>                     | <b>15</b> |               |

## QUESTION 4.4

## Quantity Surveying

| Item           | Measurement    | Result               | Description                              |
|----------------|----------------|----------------------|------------------------------------------|
|                |                |                      | (4.4.1)                                  |
| 1/             | 6,0            |                      | Area of building                         |
|                | <u>4,0</u>     | 24 m <sup>2</sup>    |                                          |
|                |                |                      |                                          |
|                |                |                      | Perimeter of building                    |
| 2/             | <u>6,0</u>     | 12 m                 |                                          |
| 2/             | <u>4,0</u>     | <u>8 m</u>           |                                          |
|                |                | 20 m                 |                                          |
|                |                |                      |                                          |
|                |                |                      | (4.4.2) Bricks                           |
|                |                |                      | Total wall area (Southern Wall)          |
| 1/             | 2,7            |                      |                                          |
|                | <u>6,0</u>     | 16,2 m <sup>2</sup>  |                                          |
|                |                |                      | Door area                                |
| 1/             | 2,1            |                      |                                          |
|                | <u>0,9</u>     | 1,89 m <sup>2</sup>  |                                          |
|                |                |                      | Window area                              |
| 1/             | 1,5            |                      |                                          |
|                | <u>1,2</u>     | = 1,8 m <sup>2</sup> |                                          |
|                |                |                      | Total area less openings                 |
|                |                |                      | 16,2 – 1,89 + 1,8 = 12,51 m <sup>2</sup> |
|                |                |                      |                                          |
| 1/             | 12,51          |                      | Total number of bricks                   |
|                | <u>110</u>     | = 1 377 bricks       |                                          |
|                |                |                      |                                          |
|                |                |                      | (4.4.3) Volume of slab:                  |
| 1/             | 5,56 m         |                      | Inside length: 6 – 0,44 = 5,56 m         |
|                | 3,56 m         |                      | Inside width: 4 – 0,44 = 3,56 m          |
|                | <u>0,075</u>   | 1,48 m <sup>3</sup>  |                                          |
|                |                |                      |                                          |
|                |                |                      | (4.4.4)                                  |
|                |                |                      | Ratio: 2 Cement: 4 Stone: 4 Sand         |
|                |                |                      | 2 + 4 + 4 = 10                           |
|                |                |                      |                                          |
|                |                |                      | Cubic meter stone needed:                |
| $\frac{4}{10}$ | <u>1,48</u> OR | 0,59 m <sup>3</sup>  |                                          |
| 0,4            | <u>1,4</u>     | 0,59 m <sup>3</sup>  |                                          |

**QUESTION 5.2.1 VECTOR DIAGRAM**



\*Use a mask to mark vector diagram.

**QUESTION 5.2.2**

Determine the magnitude of the following members.

| Member       | Magnitude               | Marks    | Mark obtained |
|--------------|-------------------------|----------|---------------|
| AE           | 19 N (18 N – 20 N)      | 1        |               |
| FG           | 10,5 N (9,5 N – 11,5 N) | 1        |               |
| <b>TOTAL</b> |                         | <b>2</b> |               |

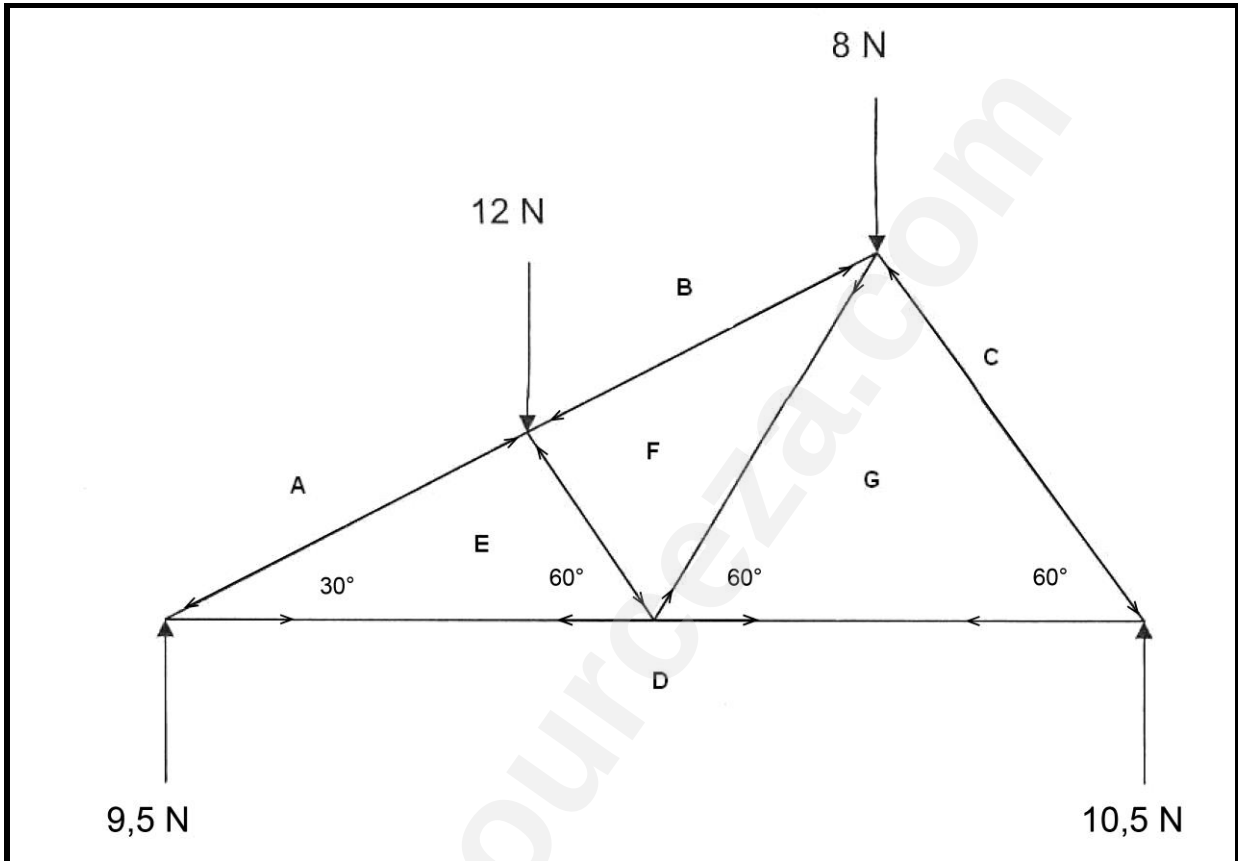
\*Tolerance of 1 N on either side

### QUESTION 5.2.3

Indicate nature of six different members on the space diagram by means of arrows.

\*\*\*\* Members AE, BF, CG, FG, FE and ED correctly indicated 1 mark each.

ANY SIX



## QUESTION 6.1

|        | Question                                                                                      | Answer                                                                              | Marks     | Mark obtained |
|--------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------|---------------|
| 6.1.1  | Name the type of eave shown at A.                                                             | Closed eave                                                                         | 1         |               |
| 6.1.2  | Identify the missing wooden part at B between the roof covering and the rafter.               | Purlin                                                                              | 1         |               |
| 6.1.3  | Identify part C.                                                                              | Roof ridge                                                                          | 1         |               |
| 6.1.4  | Identify part D.                                                                              | Barge board/<br>Verge board                                                         | 1         |               |
| 6.1.5  | Identify part E.                                                                              | Fascia board                                                                        | 1         |               |
| 6.1.6  | Identify part F.                                                                              | Door frame                                                                          | 1         |               |
| 6.1.7  | Identify part G.                                                                              | Hard-core fill                                                                      | 1         |               |
| 6.1.8  | What will be the minimum measurement at H on the load-bearing wall foundation?                | 600 mm                                                                              | 1         |               |
| 6.1.9. | What will be the minimum measurement at J on the load-bearing foundation?                     | 200 mm                                                                              | 1         |               |
| 6.1.10 | Explain the meaning of the abbreviation NGL.                                                  | Natural Ground Level                                                                | 1         |               |
| 6.1.11 | Explain the meaning of the abbreviation FFL.                                                  | Finished Floor Level                                                                | 1         |               |
| 6.1.12 | The scale of the Sectional view AA is 1:50. Name one other acceptable scale that can be used. | 1 : 25 /<br>1 : 100 /<br>1 : 200<br><b>Any ONE answer</b>                           | 1         |               |
| 6.1.13 | Describe the meaning of the dashed lines on the windows.                                      | Direction window closes/opens                                                       | 1         |               |
| 6.1.14 | What will be placed between part G and the slab to prevent penetration of moisture?           | Damp proof course                                                                   | 1         |               |
| 6.1.15 | Draw the symbol used to indicate the use of stock brick on the sectioned wall.                |  | 1         |               |
|        | <b>TOTAL</b>                                                                                  |                                                                                     | <b>15</b> |               |

QUESTION 6.2

| Assessment criteria    | Marks     | Marks obtained |
|------------------------|-----------|----------------|
| Correct elevation      | 2         |                |
| Door                   | 1         |                |
| Step                   | 1         |                |
| Roof height            | 2         |                |
| Window 1               | 2         |                |
| Window 2               | 2         |                |
| Gable roof with valley | 2         |                |
| Verge                  | 1         |                |
| Eave overhang          | 1         |                |
| Roof ridge             | 1         |                |
| Rainwater pipe         | 1         |                |
| Fascia board           | 1         |                |
| Height of FFL          | 1         |                |
| Height to wall plate   | 1         |                |
| Any FOUR labels        | 4         |                |
| Neatness               | 2         |                |
| <b>TOTAL</b>           | <b>25</b> |                |

ROOF RIDGE

VERGE BOARD  
(Barge board also acceptable)

DOWN PIPE

FFL

FFL

NGL

NGL

STEP

**SOUTH ELEVATION**

**SCALE 1:50**