ADVANCED LEVEL NATIONAL EXAMINATIONS 2013; TECHNICAL AND PROFESSIONAL TRADES

EXAM TITLE: Technical Drawing and Domestic Electricity

OPTION: Public Works (PWO)

DURATION: 3 hours

INSTRUCTIONS:
This paper contains three (3) Sections:

Section I: Fifteen (15) questions, all compulsory. 55 marks

Section II: Five (5) questions, choose any three (3). 30 marks

Section III: Two (2) questions, choose any one (1). 15 marks

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Section I. All the questions are compulsory  55 marks

01. Using a sketch, show the format of drawing sheet (Relation from A0).  4 marks

02. What is the size of A3 and A4 format?  2 marks

03. Give the 3 types of scales.  3 marks

04. What are the two (2) main lettering in drawing?  2 marks

05. Complete the following table:

<table>
<thead>
<tr>
<th>Type of line</th>
<th>Use of the line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dashed line</td>
<td></td>
</tr>
<tr>
<td>Thin line</td>
<td></td>
</tr>
<tr>
<td>Mixte line</td>
<td></td>
</tr>
</tbody>
</table>

06. Give the 3 principles of view in drawing  3 marks

07. Calculate the scale of a line where 1cm represents 0.5m.  2 marks

08. Trace a circle of 6cm diameter and indicate the dimensions correctly.  3 marks

09. A line of 1cm is drawn on the drawing sheet. If the actual length of this line is 1km. Calculate the representative fraction (RF) of the scale and name it.  5 marks

10. Complete the following table:

<table>
<thead>
<tr>
<th>No</th>
<th>Hachures</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>?</td>
<td>Masse concrete</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>4</td>
<td>?</td>
<td>Natural soil</td>
</tr>
</tbody>
</table>

11. Choose the correct dimensioning:

a.  1 mark

b.  1 mark

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12. a) A line of a road of 5cm is drawn on the drawing sheet to represent an actual length of 10mm. Show the type of scale in calculating the RF of the scale.  
   b) What are the two (2) practice methods used to indicate the dimensions on drawing?  

13. What are the 3 ways in which the circuit may be connected?  

14. What are the two (2) units of electric power?  

15. Give the corresponding symbols of the following, using the table below:  
   a) Power supply general  
   b) Resistor  
   c) Ringer  
   d) Variable resistor  
   e) Switch off  
   f) Hydro-electric power station  

<table>
<thead>
<tr>
<th>No</th>
<th>Symbols</th>
<th>Nomination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section II. Choose and answer any three (3) questions  30marks  

16. a) Make the dimensions correctly.  

b) Draw the plan here below on 1/100 and make the dimensions in good order.  

17. What are the main inscriptions to write in title bloc?  

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18. Considering the roof represented by the following diagram:

```
D
1.50
5m
A
1.50
5m
B
5m
C
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a) Find its slope AB and the inclination angle \( \theta \).  
   4 marks

b) Selecting the right triangle ABC, indicate the slope AB on the figure correctly.  
   6 marks

19. The energy absorbed in 10 minutes by a piece of electrical apparitions from 24V supply is \( 132 \times 10^6 \) joules. Calculate:

a) The current I.  
   6 marks

b) The quantity of electricity q in coulomb taken in 1 minute.  
   4 marks

20. The three (3) coils A, B, C have resistance 4, 8 and 10 \( \Omega \) respectively. Using the following sketch, find the equivalent resistance when they are connected (a) in series, (b) in parallel.  
   10 marks

Section III. Choose and answer any one (1) question. 15 marks

21. Using sketches, show:

   a) Masonry in section.  
      5 marks

   b) Lintel in RC in cross section (square lintel).  
      5 marks

   c) What is the instrument used for:
      1 mark

      i. Tracing of an angle;
      3 marks

      ii. Tracing of a perpendicular line to the horizontal line.

   d) What is the standard dimension of a door?  
      1 mark

22. Two electrostatic points charges of \( +60 \mu \text{C} \) and \( +50 \mu \text{C} \) exert are repulsive force on each other of 175N. What is the distance between two charges?  
   15 marks