

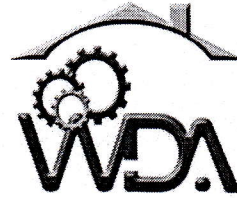
PWO – Construction Technology

**T026**

Tuesday, 17/11/2015

08:30 – 11:30

WORKFORCE DEVELOPMENT AUTHORITY



P.O. BOX 2707 Kigali, Rwanda Tel: (+250) 255113365

**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2015,  
TECHNICAL AND PROFESSIONAL TRADES**

**EXAM TITLE: Construction Technology**

**OPTION: Public Works (PWO)**

**DURATION: 3hours**

**INSTRUCTIONS:**

The paper is composed of **three (3) Sections:**

Section I: Fourteen (14) questions, all **Compulsory.** **55marks**

Section II: Five (5) questions, **Choose Three (3) only.** **30marks**

Section III: Two (2) questions, **Choose only One (1).** **15marks**

The use of calculator is admitted

**Every candidate is required to strictly obey the above instructions. Punishment measures will be applied to anyone who ignores these instructions.**

**Section I. Fourteen (14) Compulsory questions. 55marks**

01. What are the four (4) soil types according to particle sizes? **4marks**
02. Give four reasons why a stepped foundation is the most economical alternative on a sloping construction site. **4marks**
03. i) Compare the rapid hardening and ordinary Portland cements in terms of setting time and strength developed after setting. **2marks**  
ii) What is the main consideration governing the choice of the type of a brick to be used? **1mark**
04. Mention six (6) requirements for a good formwork. **3marks**
05. List in chronological order the steps involved in painting a building wall. **5marks**
06. List down five (5) types of finishing mortar joints. **5marks**
07. A "lean-to roof" has a rise of 4m and a span of 8m, calculate its slope and pitch. **4marks**
08. Apart from the concrete slab, what are other layers of the ground floor of a residential house? **4marks**
09. What are three (3) basis of classification of windows? **3marks**
10. State two (2) basic functional requirements of scaffolding in masonry work. **4marks**
11. Bricks are generally bonded with cement mortar. What are the purposes of brick bonding? **3marks**
12. What are factors affecting the workability of concrete? **5marks**
13. With help of neat sketches differentiate confined excavation from sloped excavation. **3marks**
14. Suppose you are requested to supervise and approve the executed masonry wall, what will you check about these elements: water, cement, mortar, stones and workmanship? **5marks**

**Section II. Answer any three (3) questions of your choice**

**(Do not choose more than three questions). 30marks**

15. Discuss two functions of water as an active component of concrete. **10marks**
16. Explain how a mason maintains the quality of brick laying by checking alignment, vertically and level. **10marks**
17. Describe the two types of roofs based on geometrical considerations. **10marks**
18. i) Explain different functions served by flooring. **10marks**  
ii) Differentiate solid floor from suspended floor. **10marks**
19. i) Differentiate mobile scaffold from suspended scaffold? **10marks**  
ii) Why is scaffolding taken as false work? **10marks**

**Section III. Answer any one (1) question of your choice**

**(Do not choose more than one question). 15marks**

20. i) Given a staircase of 2.4m total rise, 2.925m total going, 14 risers and 13 goings, check the suitability of this staircase using the formula:  
 $2R + G = 550 \text{ to } 700$ , whereby R and G stands for single rise and single going respectively. **15marks**  
ii) Upon which factors depends the period of curing concrete? **15marks**
21. i) With help of neat sketches differentiate brick masonry in "English bond" from "Flemish bond" as seen in elevation view. **15marks**  
ii) In a tabular format, distinguish "English bond" from "Flemish bond" with three (3) clear characteristics on each bond. **15marks**
22. The Building Coverage ratio is defined as the ratio of built area over plot area.  
a. Find the Building Coverage ratio (in percentage) for a rectangular plot of 30m to 20m and a rectangular building of 20m to 18m. **15marks**  
b. What is its importance in urban planning?  
c. What is the biggest value of this ratio and why? **15marks**