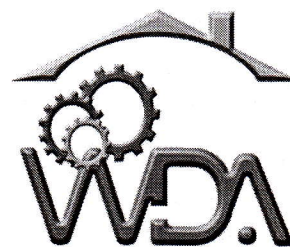CST – Construction Surveying and Site Management

T019

Tuesday, 27/11/2018
08:30 – 11:30 AM

WORKFORCE DEVELOPMENT AUTHORITY

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

ADVANCED LEVEL NATIONAL EXAMINATIONS, 2018, TECHNICAL AND PROFESSIONAL STUDIES

EXAM TITLE:

CONSTRUCTION SURVEYING AND SITE MANAGEMENT

OPTION: Construction (CST)

DURATION: 3 hours

INSTRUCTIONS:

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

Section I: Thirteen (13) compulsory questions.   **55 marks**

Section II: Attempt **any three (3)** out of five questions.   **30 marks**

Section III: Attempt **any one (1)** out of three questions.   **15 marks**

Note:

Every candidate is required to carefully comply with the above instructions. Penalty measures will be applied on their strict consideration.

Section I. Thirteen (13) Compulsory questions   55 marks

01. Differentiate accuracy from precision.   **(2 marks)**

02. Define the term surveying.   **(2 marks)**

03. Give three (3) sources of measurement errors.   **(3 marks)**

04. Mention five (5) advantages of tachometric surveying   **(5 marks)**

05. Define:

     i) Site planning   **(2 marks)**

     ii) Safety   **(2 marks)**

06. State four (4) methods of moving materials on site.   **(4 marks)**

07. List seven (7) information keys that all requisitions of construction materials must contain.   **(7 marks)**

08. Mention Five (5) uses of leveling.   **(5 marks)**

09. Define (5) different types of surveying methods.   **(5 marks)**

10. Calculate the zenith angle for each of the following vertical angles 8°45' and -15°.   **(4 marks)**

11. State three (3) types of errors made in reading angles with the theodolite.   **(3 marks)**

12. Give Six (6) basic rules for contour lines.   **(6 marks)**

13. Enumerate five (5) causes of the construction delay.   **(5 marks)**

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

14.   a) List the four chief types of a level.

     b) What is the use of plumb bob on theodolite?

     c) State out all axes in theodolite.

     d) What is a trunnion axis?   **(10 marks)**

15. Explain the functions of a project manager.   **(10 marks)**

16. Discuss at least 10 jobsite rules.   **(10 marks)**

17. The pool made in burnt bricks wall of 25m long, 3 m deep and 40 cm thick must be constructed by a crew of five (5) masons and three (3) helpers; if the entire crew can construct 2 m³ of masonry work per day; One Mason gets F4,000 RW/day and One helper gets F1,500 RW/day.

Estimate the duration of this work and the price it will cost. **(10 marks)**

18. Fill up the missing quantities for the table below by rise and fall method and make the arithmetic check.

Station	B.S	I.S	F.S	RISE	FALL	R.L	Remarks
1	4.005					125.630	B.M
2	X		2.105	X		X	
3		3.230		X		127.655	
4		X		1.040		X	
5	1.140		2.565		X	X	
6	X		X		1.080	X	
7			1.420	0.300		127.540	

(10 marks)

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

19. The angles at the stations of a closed traverse ABCDEFA were observed as given below:

Traverse station	Included angle
A	120°35'00"
B	89°23'40"
C	131°01'00"
D	128°02'20"
E	94°54'40"
F	155°59'20"

Adjust the angular error in the observations, if any, and calculate the bearings of the traverse lines in the following systems if whole circle bearing of the line AB is 42°:

    (a) Whole circle bearing in sexagesimal system;

    (b) Quadrantal bearing in sexagesimal system;

    (c) Corresponding values in centesimal system for **(a)**. **(15 marks)**

20. A page of level book is reproduced below in which some readings marked as (×) are missing. Complete the page with all the details of calculations and arithmetic checks.

Station	B.S.	I.S.	F.S.	Rise	Fall	R.L.	Remarks
1	3.150					×	
2	1.770		×		0.700	×	C.P.
3		2.200			×	×	
4	×		1.850	×		×	C.P.
5		2.440			0.010	×	
6	×		×	1.100		×	C.P.
7	1.185		2.010	×		222.200	C.P.
8		−2.735		×		×	Staff held inverted
9	×		1.685		4.420	×	C.P.
10			1.525		0.805	×	
Σ	12.055		×	×	×		

(15 marks)

21. Discuss the characteristics, duties and responsibilities of all main participants in a construction project (building team) and at the end use a flowchart for illustration.

(15 marks)