

**CST – Cost Estimation**

**T014**

**Tuesday, 15/11/2016**

**08:30 – 11:30**

WORKFORCE DEVELOPMENT AUTHORITY



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2016,  
TECHNICAL AND PROFESSIONAL STUDIES**

**EXAM TITLE: Cost Estimation**

**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****55marks**

- 01.** How do you define an estimate of a construction project? **3marks**
- 02.** List out three types of data required to prepare an estimate. **3marks**
- 03.** Name and explain three items of work which requires cost estimation. **3marks**
- 04.** Estimate the quantity of brickwork and plastering required in a wall of 4m long, 3m high and 20cm thick. Calculate also the cost if the rate of brickwork is 70,000 FRW per m<sup>3</sup> and plastering is 1,800 FRW per m<sup>2</sup>. **5marks**
- 05.** What do you understand by schedule of reinforcement in estimating and costing? Discuss the key elements which are enclosed in the schedule of reinforcement. **4marks**
- 06.** Explain briefly how to conduct a cost estimation of sanitary works. **6marks**
- 07.** By means of neat sketches and related equations, state and explain three methods used for quantity estimation of earthworks. **6marks**
- 08.** After differentiating the cost to the value, discuss five purposes of valuation. **6marks**
- 09.** Outline two types of construction contracts by the method of pricing. **4marks**
- 10.** Discuss four forms of Cost-type construction contracts. **6marks**
- 11.** List out three documents which are enclosed in the construction contract. **3marks**
- 12.** By using examples, differentiate original works and repair works in estimating and costing. **3marks**
- 13.** Differentiate the contract to a tender. **3marks**

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

- 14.** Briefly explain the two general factors affecting the tender price. **10marks**
- 15.** Many people think that only cost of land, materials and labors are included in an estimate. With a comprehensible diagram show all parameters with their sub-divisions included in the complete estimate. **10marks**

16. Complete the table below:

10marks

S/N	Particular items	Unit of measurement
1	Earth work	
2	Concrete	
3	Damp Proof Course (D.P.C)	
4	Brick work	
5	Stone Work	
6	Plastering	
7	Flooring	
8	Hand railing	
9	Rain water pipe	
10	Glass panels	

17. Overhead costs include the miscellaneous indirect and other costs which are not productive expenses on the job. Provide ten different types of overhead costs.

10marks

18. Prepare a preliminary estimate of a building having area equal to 1600m<sup>2</sup>.

Given that:

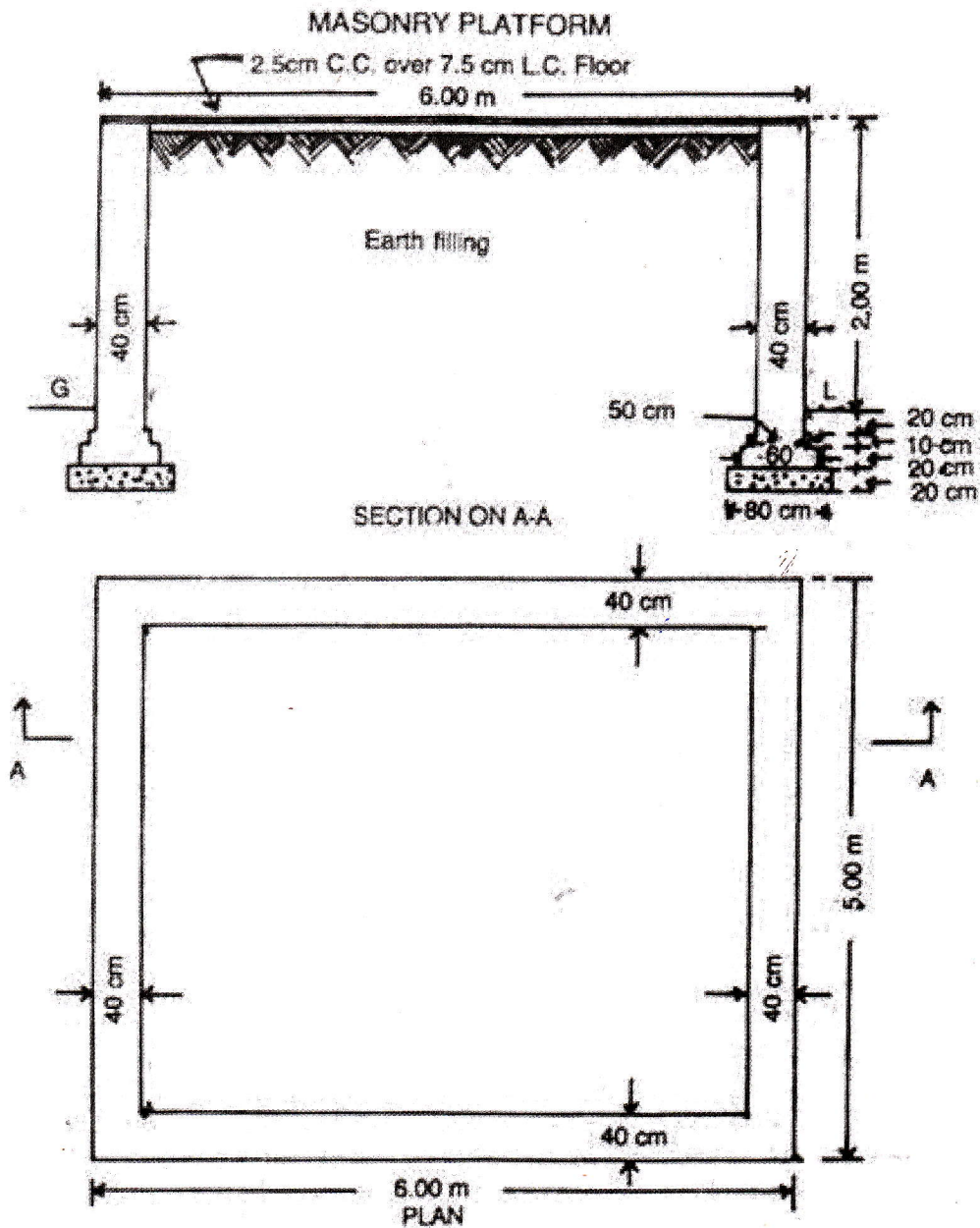
- i. Plinth area rate = 240,000 FRW
- ii. Extra for Architectural work = 1.5% of the building cost
- iii. Extra for electricity installation (10%) + water supply and sanitary installations (6%) = 10 + 6 = 16% of the building cost
- iv. Extra for other services = 8% of the building cost
- v. Contingencies and supervision charges = 10%

10marks

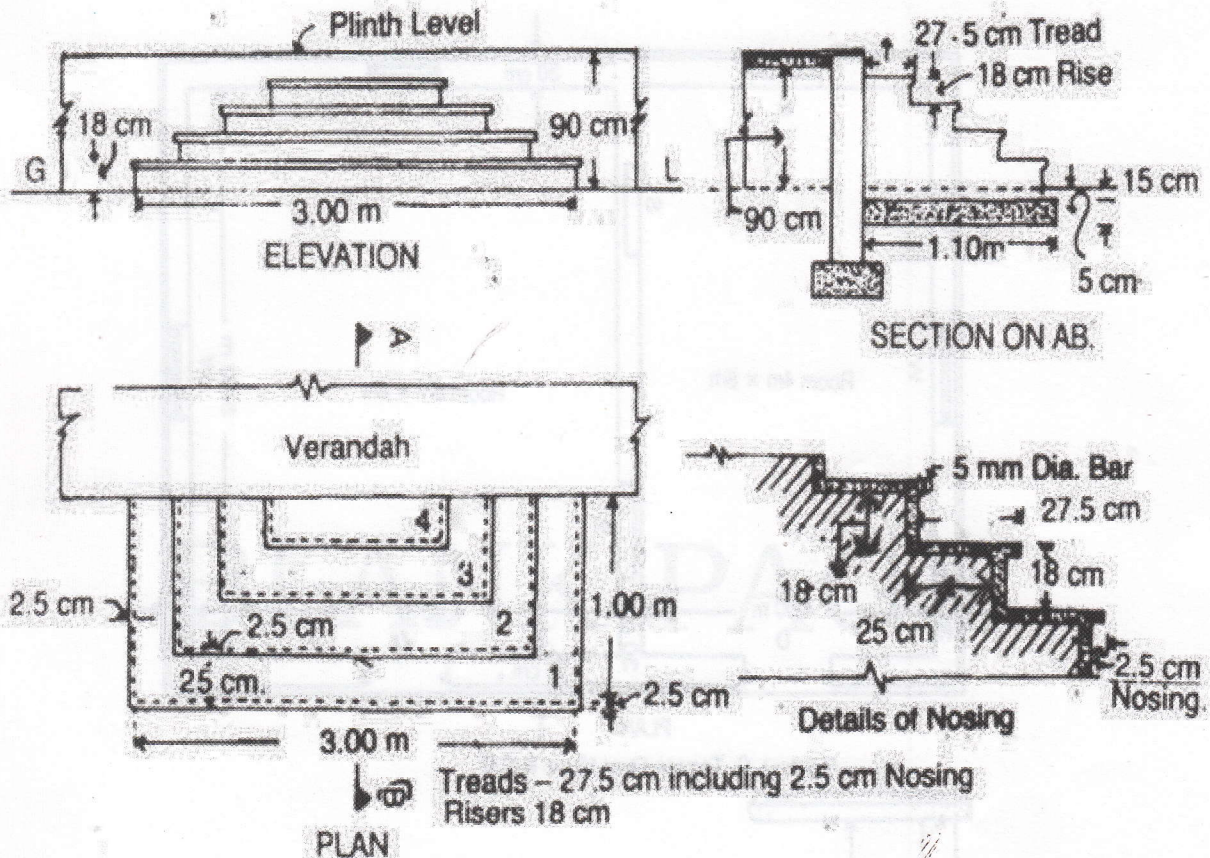
19. Estimate the measurement of quantities of a masonry platform 6m x 5m from the given drawing below and specifications.

General Specifications:

- a. Foundation –lime concrete
- b. Masonry -1<sup>st</sup> class brickwork in lime mortar
- c. Flooring- 2.5cm cement concrete over 7.5 cm lime concrete, over wall only  
2.5cm cement concrete
- d. Wall finishing- outside walls are 12mm cement plastered 1:6.



20. In the figures below, you are given an elevation, section and a plan of a main step. The surface of steps is provided with 2.5 cm c.c 1: 1½: 3 finished with neat cement. The tread is 27.5 cm which includes 2.5 cm nosing. The rise is 18 cm.



Estimate the quantities of the total materials used in each of the following items:

- Earthwork in excavation (1mark)
- Concrete in foundation (1mark)
- Brickwork – 1<sup>st</sup> to 4<sup>th</sup> steps (4marks)
- 2.5 cm c.c. 1: 1½ : 3 in surface finishing from 1<sup>st</sup> step to the 4<sup>th</sup> step (treads & risers, fronts and sides) plus plinth-riser (5marks)
- 2.5 cm Nosing, 1<sup>st</sup> step to the 4<sup>th</sup> step. (4marks)

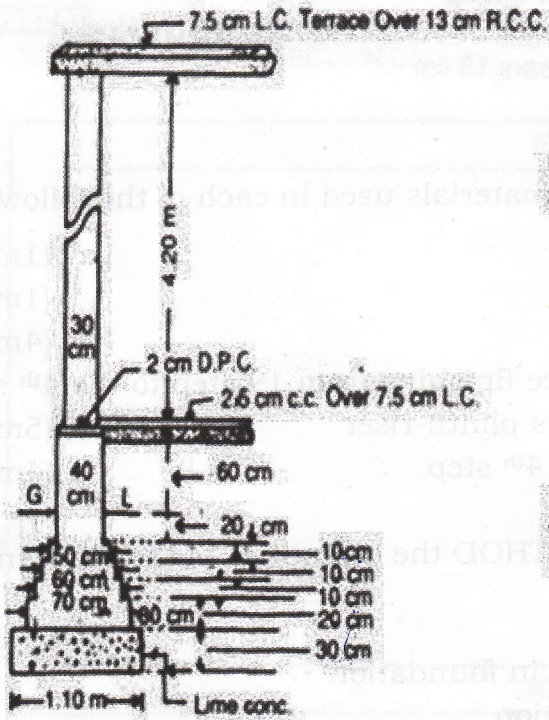
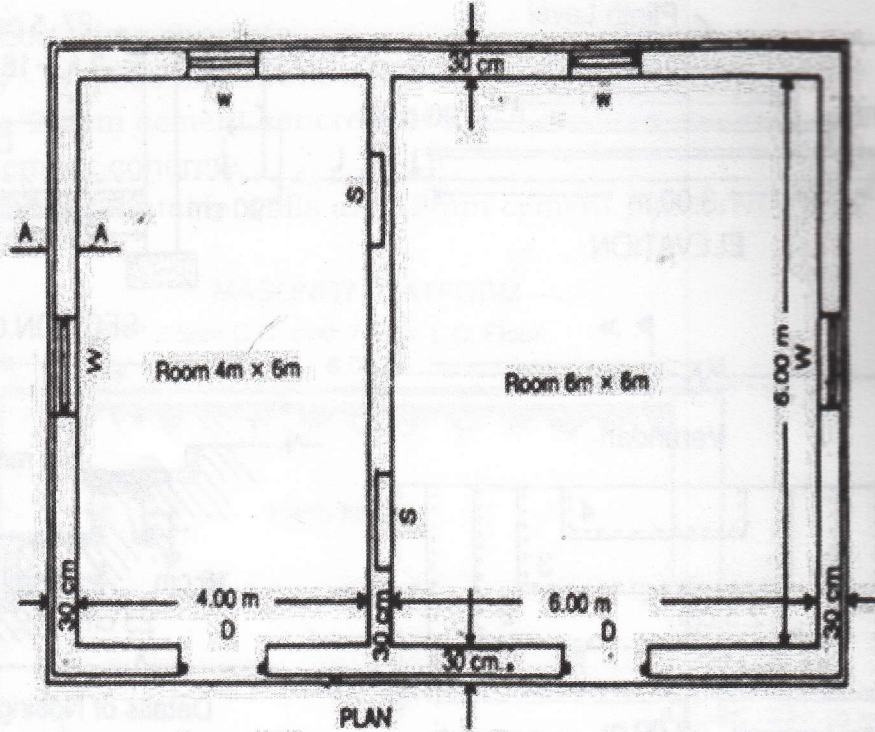
21. Estimate BY CENTRE LINE METHOD the quantities of the following items of a two roomed building.

- Earthwork in excavation in foundation
- Lime concrete in foundation
- 1<sup>st</sup> class brickwork in cement mortar 1:6 in foundation and plinth
- 2.5cm c.c damp proof course and
- 1<sup>st</sup> class brickwork in lime mortar in superstructure

**Additional information (specifications)**

- **Back of shelves is 10cm thick wall (Breadth of shelves is 20cm)**
- **Bearing length of the lintels over doors, windows n over shelves is 15cm each side**

**TWO ROOMED BUILDING**



All Walls are of same section  
Lintels over Doors, Windows and  
Shelves are 15 cm thick R.B.

Doors D-1.20 m x 2.10 m  
Windows W-1.00 x 1.50 m  
Shelves S-1.00 m x 1.50 m

**Note :**

No beam has been shown in the plan as the object of this example is to explain the method of estimating the walls only.