

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF BUILT ENVIRONMENT**  
**DEPARTMENT OF QUANTITY SURVEYING**  
**BACHELOR OF QUANTITY SURVEYING (HONOURS) DEGREE**  
**PART IV SUPPLEMENTARY EXAMINATIONS –2012**  
**MEASUREMENT III - AQS 4107**

**Time: 3 hours**

**Total marks: 100**

**Instruction to candidates**

Answer all questions

SMM Booklet to be provided

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**SECTION A (Plumbing)**

**Question One**

Fig 1 shows the layout for a residence. Given that

- Pipes in trenches to be laid 750mm deep.
  - All waste and drainage pipes to be of UPVC
  - Municipal sewer connection to be 15m from building
  - The ceiling height of the building is 3m
  - Gutters to be 120x 100mm sheet metal
  - Rain water pipe to be 75 x 75mm sheet metal
- a) Take off soil drainage and waste water discharge (35 marks)
- b) Take off the rainwater disposal (15 marks)

**SECTION B: Civil & Structural Engineering Work**

**Question Two**

A proposed railway line is to be constructed between Bulawayo and Lupane Business Centre. Levels were extracted from portion of the railway line in order to construct an embankment with a width of 2m and side slopes of 1:2. The ground levels along the two sides of the line from chainage 10 to chainage 15 are given below. The chain was taken at 40m intervals.

Chainage	10	11	12	13	14	15
H <sub>1</sub>	1.20	1.45	1.60	1.30	1.00	0.80
H <sub>2</sub>	1.50	1.80	200	1.50	1.20	0.80

Calculate the volume of earthworks for the embankment.

(25 marks)

### Question Three

A road is to be constructed in a side long ground partly in cutting and partly in banking. The formation width of the road is 10m, cross slope of ground is 6:1, side slopes are 2:1 in banking and 1,5:1 in cutting, depth at the centre is 0.45m. Calculate the quantity of earthworks involved for a length of 200m. Assume that the centre of road is on the right side of the cut section.

(25 marks)