

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF BUILT ENVIRONMENT
BACHELOR OF QUANTITY SURVEYING (HONOURS) DEGREE
PART IV FIRST SEMESTER APRIL 2009
MEASUREMENT III AQS 4107

TIME: 3 Hours

TOTAL MARKS: 100

INSTRUCTIONS:

Answer Section A and Section B

SECTION A

Question One

Fig P1 shows plumbing layout of cold and hot water supply for a residence. Given that

- Galvanised mild steel pipe shall be used for cold water.
- Hot water pipe shall be of copper to BS PART 1 with fittings conex or other approved compression fittings.
- Hot and cold water valves to be fullway gate valves type to BS 1952.
- All pipework to wall shall be supported by brackets or holderbats spaced at 2m centres.
- Pipes in trenches to be laid 750mm deep.
- Wall height is 3000mm to underside of ceiling.

Required

- (a) Measure cold and hot water supply showing all assumptions made *(35 marks)*
- (b) Prepare a mini bill for the measured items *(15 marks)*

SECTION B

Question 1

- a) Describe the concept of bulking of excavated material. Why is this factor important in the qualification of earthworks? (5 marks)
- b) Using the information given below, determine the volumes of earthworks in the construction of a 20m wide road:-
- The road is 150m long
 - Choose suitable intervals
 - The levels at: 0 chainage is 1.2 m
50m chainage is 1.3m
100m chainage is 1.5m
150m chainage is 1.2 m
 - The final embankment should slope at 1:1:3 (10 marks)

Question 2

The table below shows ground levels and formation levels for a proposed road construction. Embankments are to be built with side slopes of 1:2:5 and the cuttings with the slopes of 1:3:0 the embankment crest width and cutting base width is 13m. It may be assumed that the ground is horizontal across the section

Chainage	Ground level	Formation level	Chainage	Ground level (m)	Formation level (m)
0	28	35	800	4	11
100	29	32	900	3	8
200	32	29	1 000	2	5
300	35	26	1 100	-5	2
400	30	23	1 200	-5	2
500	19	20	1 300	10	5
600	11	17	1 400	15	8
700	7	4	1 500	23	11

Determine the volumes of earthworks using both Simpson Rule and the average end area method. Which method is more accurate? Justify your answer. (20 marks)

Question 3

Take off the structural steel quantities of the roof layout shown in figure S.1. Present the calculations in the form of a standard bill of quantities. (15 marks)