



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF BUILT ENVIRONMENT

DEPARTMENT OF QUANTITY SURVEYING

ENGINEERING SURVEYING

AQS 1208

Main Examination Paper

MAY 2016

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: A Shanji

INSTRUCTIONS

1. Answer ALL Questions

MARK ALLOCATION

QUESTION	MARKS
1.	20
2.	20
3.	20
4.	20
5.	20

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QUESTION ONE

The following consecutive readings were taken with a dumpy level on a continuously sloping ground at a common interval of 20m. The last station has an elevation of 155.272m. Rule out a level book page and enter the readings.

0.420; 1.115; 2.265; 2.900; (3.615; 0.535) ; 1.470; 2.815; 3.505; (4.445; 0.605); 1.925; 2.885

Calculate

- a) The reduced levels of the points by **Rise and Fall Method**. [15]
- b) The gradient of the line joining the first and last points. [5]

QUESTION TWO

- a) What are the responsibilities of an Engineering Surveyor on a construction scheme or a project? [10]
- b) Describe in detail the methods of controlling verticality during the construction of a multi-story building. [10]

QUESTION THREE

a) The following tacheometric observations were made with a theodolite set up @ A and the staff, held vertical, foliage partially obstructs the view when the following readings were taken.

Staff @	Horizontal Circle reading	Vertical Angle	Lower Reading (m)	Middle Reading (m)	Upper Reading (m)
B	30° 45' 00"	87° 20' 00"	2.377	2.565	2.753
C	115° 13' 00"	92° 45' 00'	1.533	1.956

Height of Instrument 1.450 m

Reduced Level of A 100 m

Instrument Constant K 100

Additive Constant C 0

- i) Determine distance AB, AC and BC

ii) Determine the Reduced Level of C given Reduced Level of A as 1431.820m.

[10]

b) The following data was obtained by stadia tacheometry, vertical angle was $+8^{\circ} 00' 00''$ staff intercept (S) was 2.5m, stadia interval factor was known to be 100, additive constant was 0 and the distance from centre of instrument to principal axis (C) was 0.75m.

Calculate the horizontal distance (H) from the peg to staff and vertical distance (V).

[10]

QUESTION FOUR

a) State the Trapezoidal Rule and the Simpson's Rule for calculating areas. Why is the Simpson's Rule recommended for calculating areas of irregular figures as compare to the Trapezoidal Rule? [5]

b) A stockpile of Quarry has the shape of a Frustrum of a Cone. Perimeter of the Upper surface is 65m and perimeter of the Bottom surface is 210m and vertical height is 18m.

Calculate

a) Tonnage of Quarry on the stockpile

b) Angle of repose

Given that the relative density of Quarry is 1.6 kg/m^3

[15]

QUESTION FIVE

a) List the corrections that are applied to steel tape in their order and state the formula for each correction. [7]

b) Explain what is meant by the term taping and briefly discuss why steel tapes are standardised. [5]

c) A tape of nominal length 100m when standardised was found to be 101m. If the recorded length of the line AB measured with this tape was 653m. Calculate the true length of line AB. [3]

d) A tape which was found to be 0.8% too long was used to measure an area. The calculated area was 100m^2 . What was the true area? [5]