

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF BUILT ENVIRONMENT**  
**DEPARTMENT OF QUANTITY SURVEYING**  
**PART I SUPPLEMENTARY EXAMINATIONS – AUGUST 2011**  
**ENGINEERING SURVEYING – AQS1208**

Time: 3 hours

Total Marks: 100

**INSTRUCTIONS:**

Answer all questions. All questions carry equal marks.

**Requirements**

A non-programmable calculator

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**QUESTION ONE**

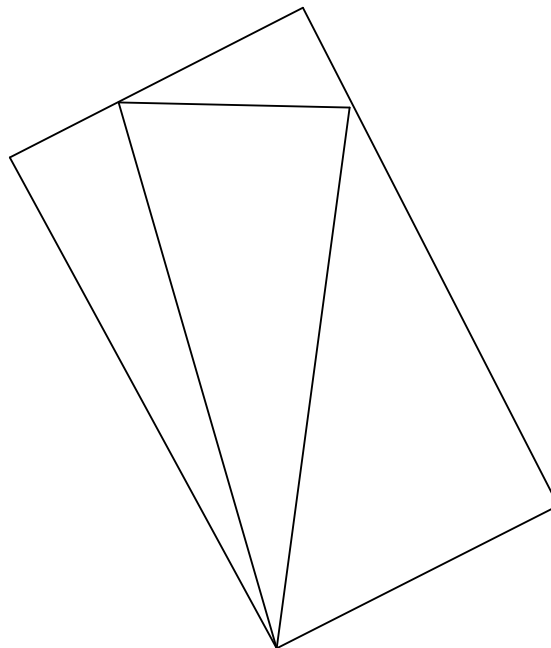
- a) write brief notes on the following
- i) Reconnaissance
  - ii) Triangulation **(5 marks)**
- b) A triangulation exercise was carried out to coordinate a point F from several already existing stations. The following observation and data was made available to triangulate F. See diagram below.

**Coordinates**

A	600, 584	615, 620
B	744, 236	520, 487
C	769, 266	814, 307

**Angles**

CAB	=	43 <sup>0</sup> 01' 30"
CBA	=	61 <sup>0</sup> 39' 10"
ECD	=	35 <sup>0</sup> 42' 20"
EDC	=	91 <sup>0</sup> 01' 50"
FAE	=	48 <sup>0</sup> 51' 40"
FEA	=	62 <sup>0</sup> 13' 00"



**(20 marks)**

### **QUESTION TWO**

- a) Describe in detail methods of controlling verticality during construction of a multi-storey building. **(10 marks)**
- b) In deformation surveys it is very important to plan the survey. What are some of the most important considerations during the planning stage? **(15 marks)**

### **QUESTION THREE**

- a) Given coordinates in metres

A +212 640, 515 + 7 646, 103

B +212 587,339 +7 899, 902

Calculate the distance and direction A to B. **(10 marks)**

- b) In a tape offset survey the following offsets were taken from a fence to a survey line.

Chainage	0	20	40	60	80	100	120	140	160	180
offset	0	5,49	9,14	8,03	10,17	13,00	8,73	4,27	1,83	0

Find the area (hectares) between the fence and the survey line. (Use Simpson's Rule)

**(15 marks)**

### **QUESTION FOUR**

- a) Briefly describe the two main classifications of surveying. **(5 marks)**
- b) State and explain the fundamental principle of surveying. **(5 marks)**
- c) All surveying measurements are prone to errors. State and describe briefly the three types of errors that constitute what is commonly referred to as a measurement error. **(10 marks)**
- d) Define the terms as they are used in surveying:
- i) Precision
  - ii) Accuracy **(5 marks)**

**END OF EXAMINATION**