

**REPUBLIC OF SOUTH AFRICA**  
**DEPARTMENT OF MINERAL RESOURCES**  
**EXAMINATION FOR MINE SURVEYORS CERTIFICATE OF COMPETENCY**

DATE : 13 October 2011  
TIME : 08:30 – 11:30

TOTAL MARKS: 100  
TO PASS: 50

**SURVEY 1**

**QUESTION 1**

- (a) What does WGS84 stand for?
- (b) Describe what WGS84 is and why it was needed?

[15]

**QUESTION 2**

- (a) Briefly describe GPS, what it stands for, purpose and principle of operation. (5)
- (b) Name six characteristics of contours. (12)

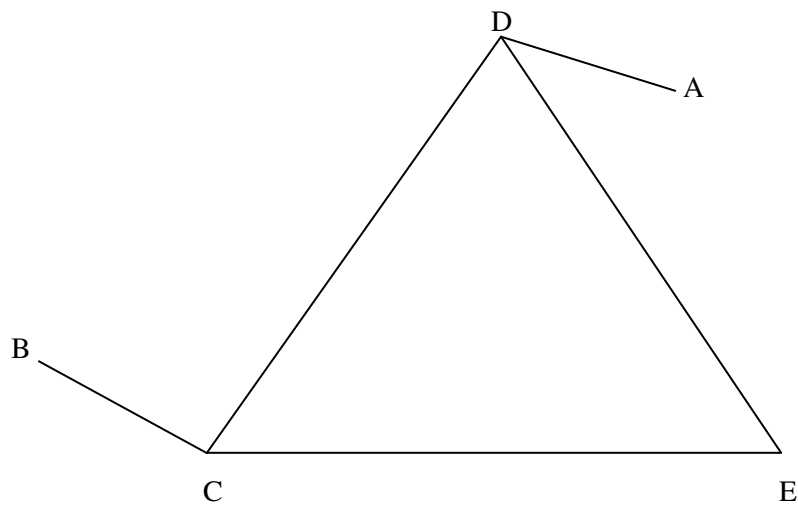
[17]

**QUESTION 3**

- (a) Name three methods of map projection. (3)
- (b) Name four different types of levels. (4)
- (c) Name and briefly describe the three classes of errors in surveying. (3)

[10]

QUESTION 4



A and B are two beacons which are not intervisible. Stations C and D have been established in order to determine the position of E.

Given : Direction  $A - B = 344^{\circ}04'54''$

HD  $A - B = 725,937\text{m}$

$BCD = 73^{\circ}25'00''$   $CB = 135,300\text{m}$

$DCE = 36^{\circ}32'00''$   $DA = 137,900\text{m}$

$ADE = 49^{\circ}16'00''$

$EDC = 67^{\circ}08'00''$

	Y	X
Co-ordinates A	+1 689,500	+3 170,200
Co-ordinates B	+1 490,400	+3 868,300

Calculate the co-ordinates of E.

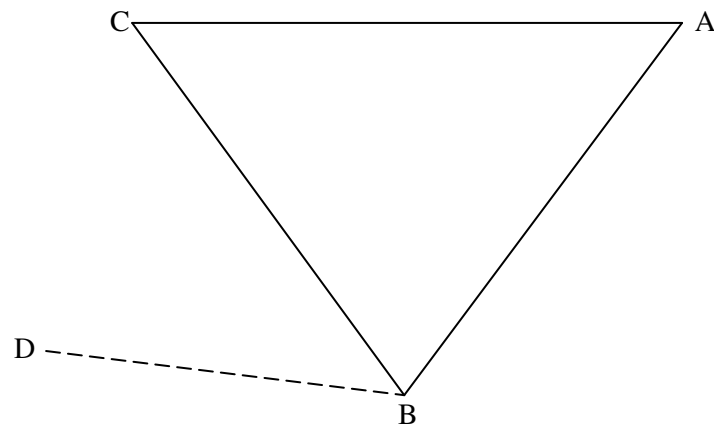
[23]

QUESTION 5

- Name three survey systems used.
- Briefly describe the South African co-ordinate system. Make use of a sketch to illustrate your answer.

[10]

QUESTION 6



In the sketch above A, B, C and D represent four beacons.

Given: Co-ordinates

	Y	X
A	0,0	+531,200
C	0,0	0,0
D	+441,900	+199,800

$$\text{Angle ABC} = 61^{\circ}12'00''$$

$$\text{Horizontal distance DB} = 131,600$$

Calculate the co-ordinates of B.

[25]

TOTAL [100]