

PROGRAM

: NATIONAL DIPLOMA

MINING ENGINEERING

SUBJECT

: GEOLOGY: MINING III

CODE

: MWG 3211

DATE

: SUPPLIMENTARY EXAMINATION

03 DECEMBER 2014

DURATION

: (Y-PAPER) 15:00 - 18:00

WEIGHT

: 40:60

TOTAL MARKS : 120

EXAMINER

: MR K S PHOGOLE

150505503

MODERATOR : MS Z MDLULI

5052

NUMBER OF PAGES : 3 PAGES AND 2 ANNEXURES

INSTRUCTIONS

1. ALL ANSWERS MUST BE SHOWN IN THE EXAMINATION SCSRIPT OR ON THE ANNEXURES PROVIDED AS REQUIRED.

2. STUDENTS MUST ENSURE THAT THEIR STUDENT NUMBER IS ON ALL ANNEXURES.

3. ALL ANNEXURES MUST BE HANDED IN EVEN IF THE STUDENT DID NOT ATTEMPT THE QUESTION.

4. CALCULATORS ARE PERMITTED (ONLY ONE PER STUDENT)

REQUIREMENTS

: DRAWING INSTRUMENTS

QUESTION 1

The attached map (MAP EX 2A/14) (ANNEXURE 1) shows an area where gold exploration is in progress. Geological mapping and a number of vertical boreholes drilled from surface have intersected a thin, tabular conglomerate reef. A fault gas also been located in the area. The map shows the surface contours in metres above sea level at 20 metre intervals. The scale is shown on the plan (1: 2 000). Geological and borehole information:-

POINT.	Depth of Conglomerate Reef	Depth of Fault
A	Reef outcrops	
В	Reef outcrops	Fault at 140m depth
С	Reef outcrops	
D	Reef 40m depth	
Е	No Reef	Fault outcrops
F		Fault outcrops

Using the information given above, construct structure contours for the geological structures and answer the following questions:

1.1.	Graphically plot the outcrop of the fault on the plan.	(5)
1.2.	Graphically plot the outcrop of the conglomerate reef on the plan.	(5)
1.3	Determine the amount (angle) and direction of true dip of the fault.	(4)
1.4	Determine the amount (angle) and direction of true dip of the reef.	(4)
1.5.	Draw the lines of intersection between the fault and the orebody.	(2)
1.6.	Shade the area that is underlain by the gold-bearing conglomerate reef. (DO NOT SHADE ANY OTHER AREAS).	(4)
1.7.	Determine the vertical throw of the fault. Classify the fault.	(4)
1.8.	Draw a true-scale section along X - Y on the graph papers provided.	(8)
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QUESTION 2

The area on the attached map EX1 - B/14 - (ANNEXURE 2) shows part of the area of a coal prospecting venture in southern Mpumalanga near the Kwazulu-Natal border. The prominent ridge of hills appears to be due to a thick dolerite dyke that has intruded along a fault plane disrupting the generally evenly dipping sandstone strata in the area. Outcrops of the top of a thick coal seam are seen at points 'F' and 'G' to the north of the ridge and this coal seam is the focus of the exploration in the area.

The scale of the map is 1:2500 and all elevations shown are in metres above sea level. The dip of the strata is known to be constant throughout the area.

Geological mapping and vertical boreholes has given geology information as follows:

	GEOLOGICAL INFORMATION			
POSITION No.	DOLERITE	DOLERITE	COAL SEAM	COAL SEAM
	TOP	BOTTOM	TOP	BOTTOM
A	20m depth	40mdepth	"outcrops"	10m depth
В	-	"outcrops"		
С	-	"outcrops"	-	
D	Not intersected	Not intersected	"outcrops"	10m depth
E	Not intersected	Not intersected	60m depth	70m depth
F	-	-	"outcrops"	-
G	-	-	"outcrops"	-
Н	?	?	?	7

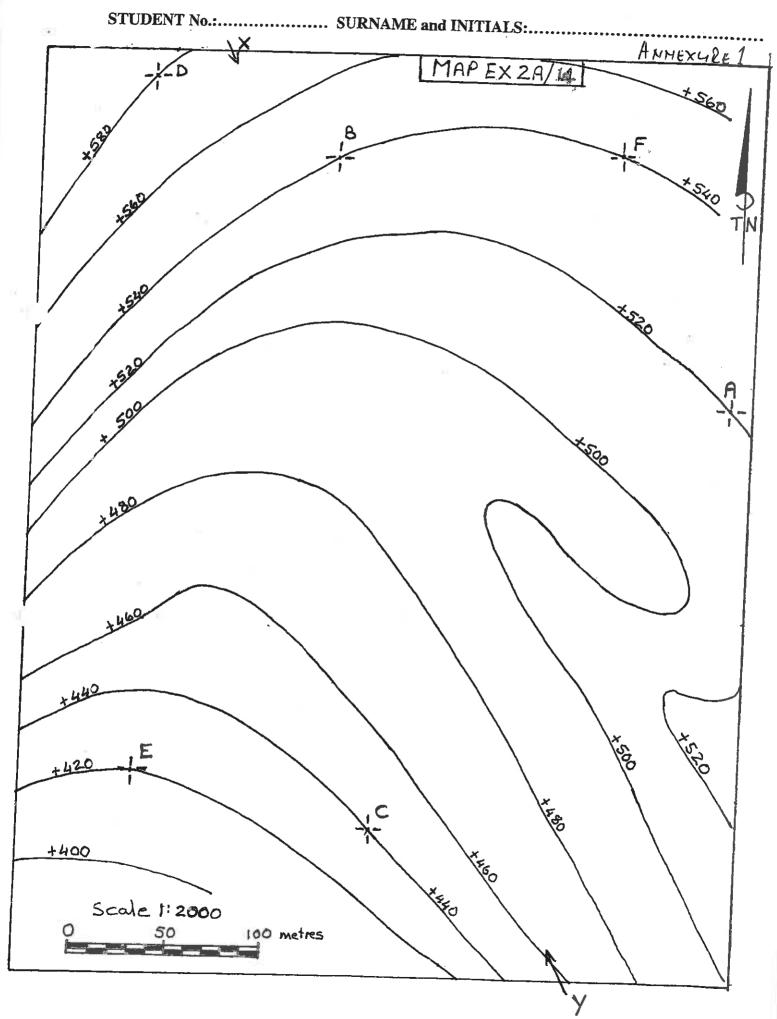
Construct structure contours for the geological features and answer the following:

- 2.1. Plot the outcrop of the dolerite dyke on the plan and neatly shade in the outcrop of the dolerite dyke. (10)
- 2.2. Using strike line construction determine the amount (angle) and direction of true dip of the dolerite dyke.(10)
- 2.3. Plot the outcrop of the coal seam on the plan and neatly shade in the outcrop area of coal. INDICATE WHICH THE COAL SEAM OUTCROP IS! (10)
- 2.4. Using strike lines determine the amount (angle) and direction of true dip of the coal seam. (10)

2.5.	Determine the vertical throw due to the dolerite (fault) and classify the f	
	(Normal or reverse?).	(5)
2.6.	Draw the lines of intersection between the Dyke/fault and the Coal seam. Doe the area between these lines represent a gain or a loss of ground?	es (5)
2.7	If the borehole at 'E' continued drilling beyond the coal seam, would it intersect the dyke and coal? If so - at what depths?	(5)
2.8	Draw a true scale section from 'X' to 'Y' showing all the geology. Remember to shade in the dolerite and the coal seam.	(10)
2.9.	Will a vertical borehole drilled at position 'H' on the top of the koppie intersect the coal seam? - if so, at what depths?	(5)
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STUDENT No.:..... SURNAME and INITIALS:....

This sheet must be handed in with your examination script!

