UNIVERSITY OF JOHANNESBURG

PROGRAM	:	NATIONAL DIPLOMA *MINING ENGINEERING*
SUBJECT	:	**GEOLOGY: MINING III**
CODE	:	**MWG3211**
DATE	:	SUPPLEMENTARY EXAMINATION 08 JANUARY 2020
DURATION	:	(X-PAPER) 15:00 - 18:00
WEIGHT	:	40: 60
TOTAL MARKS	:	100

ASSESSOR	:	MR K S PHOGOLE	0731883319
MODERATOR	:	MS Z. MDLULI	5056
NUMBER OF PAGES	:	3 PAGES	

INSTRUCTIONS :

1. ALL ANSWERS MUST BE SHOWN IN THE EXAMINATION SCRIPT 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.
: GRAPH PAPER TO BE PROVIDED

QUESTION 1

Gold prospecting is in progress in an area shown on the attached MAP CT2 – B/11. All elevations are in metres above sea level and strata dips are constant in the area.

Preliminary work has shown that a prominent quartzite layer overlying a 30 metre (vertical thickness) sequence of shale forms the hills in the area. The base of this quartzite layer outcrops as shown on the map. The base of the shale outcrops at point 'A' and 'B'. Below the shale there is a sandstone unit with a thin, gold-bearing conglomerate at the base of this sandstone. The gold-bearing conglomerate (Reef) outcrops at point 'C' as shown on the map, and was also intersected in a short, vertical borehole drilled at point 'A'. The depth to this reef in the borehole at point 'A' is 20 metres. This gold-bearing conglomerate overlies a very thick sequence of siltstone, the base of which is not seen in the map area.

A thick dyke outcrops in the valley as shown on the plan and disrupts the gold bearing conglomerate near point 'C'. It is likely that this dyke has intruded along a fault plane.

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

1.1	Complete the outcrop pattern of the dyke over the map area.	(5)
1.2	Determine the amount of direction of dip of the dyke.	(6)
1.3	Complete the outcrop pattern of all the geological units over the whole map area.	(18)
1.4	Draw the lines of intersection between the conglomerate reef and the dyke.	(4)
1.5	Determine the vertical throw (normal or reverse)	(5)
1.6	Shade the area on the map that is underlain by gold-bearing conglomerate reef. **DO NOT SHADE ANY OTHER AREAS.**	(4)
1.7	Draw a true-scale section along X-Y (north-south) on the graph papers (ANNEXURE (3) provided.	(8)
		(50)

QUESTION 2

The attached map **(CT2 – A/11)** shows part of the area of a coal prospecting venture. The plan is to a scale of 1: 1 000 and shows surface contours at 10 metre intervals above sea level. Prospecting by means of shallow, vertical holes and surface mapping has indicated the presence of a 10 metre thick (vertical thickness) coal seam that has been intersected by a thick dolerite dyke. The dyke is known to be younger than the coal seam and has intruded through, and dislocated the coal seam. The vertical thickness of the dyke is 20 metres.

Given the following, known information, answer the questions below.

POINT No.	Depth to Upper contact of coal	Depth to Lower contact of coal	Depth to Upper contact of Dyke	Depth to Lower contact of Dyke
A	-	"Outcrop"		
B	"Outcrop"	10m		
C	30m	40m		
D	40	50m	-	"Outcrop"
E	-	-	"Outcrop"	20m
F	-	-	-	"Outcrop"

2.1	Graphically plot the outcrop of the dyke on the plan	(10)
2.2	Calculate the amount (angle) and direction of dip of the dyke.	(4)
2.3	Graphically plot the outcrop of the coal seam on the plan	(10)
2.4	Calculate the amount (angle) and direction of dip of the coal seam	(4)
2.5	Determine the vertical throw on the Dyke and classify as 'normal' or 'reverse'	(6)
2.6	Draw all the coal seam / dyke lines of intersection.	(8)
2.7	On the map neatly shade the area underlain by the full thickness of coal seam. (DO NOT SHADE ANY OTHER AREAS OF THE MAP)	(8)

Total marks = [100]

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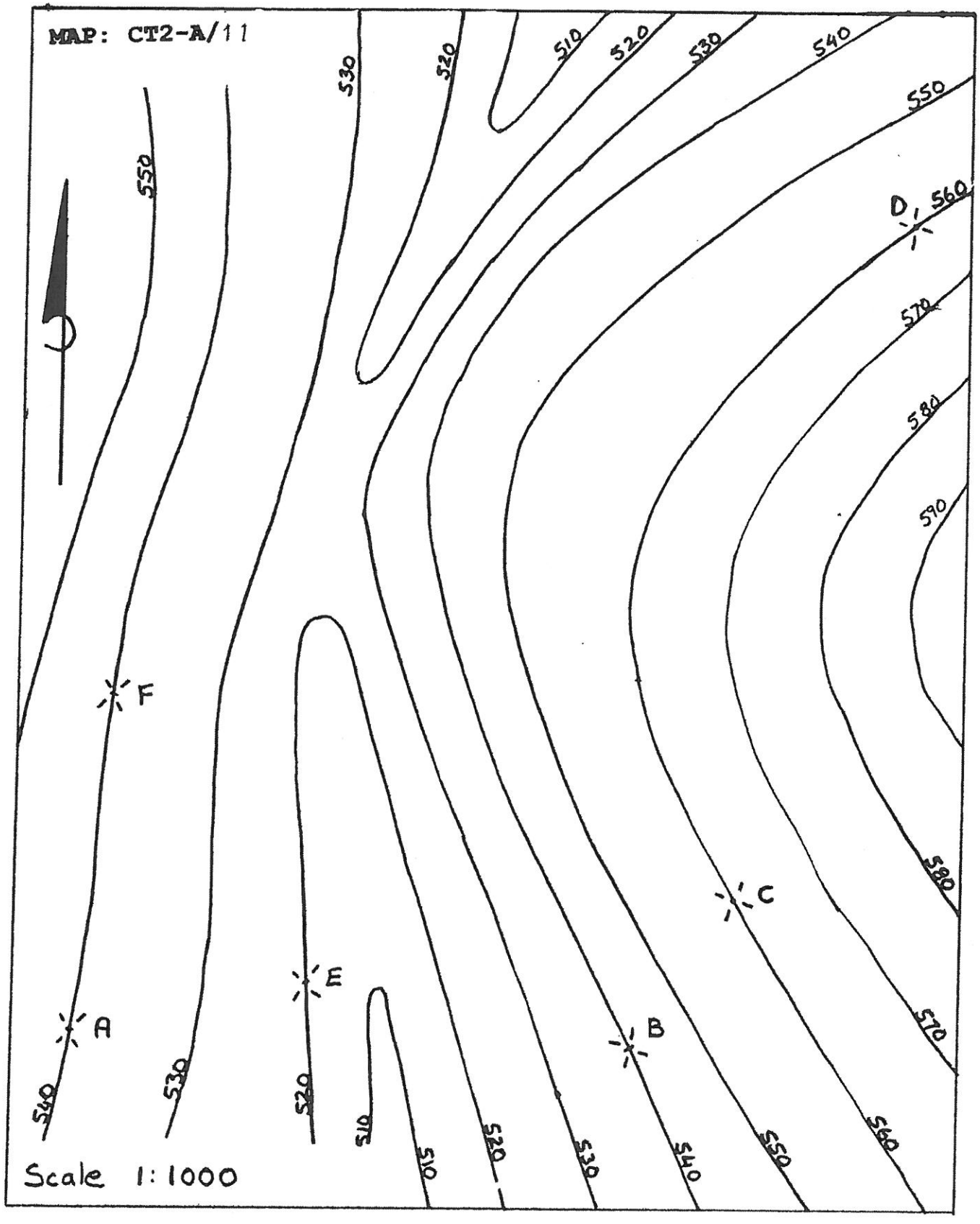
STUDENT No.:..... SURNAME and INITIALS:.....

This sheet must be handed in with your examination script!



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