

PROGRAM : B. Eng. Tech. Mining Engineering
Bachelor Mine Surveying

SUBJECT : **STRUCTURAL GEOLOGY 2B**

CODE : **SGEMN2B**

DATE : SUPPLEMENTARY EXAM
10 JANUARY 2020

DURATION : (X-PAPER) 08:00 - 11:00

WEIGHT :

TOTAL MARKS : 100

FULL MARKS : 100

EXAMINER : MR DN WILSON

MODERATOR : Prof H.J. GROBLER

NUMBER OF PAGES : 3 PAGES AND 2 ANNEXURES AND GRAPH PAPER

INSTRUCTIONS

1. ALL ANSWERS MUST BE SHOWN IN THE EXAMINATION SCRIPTS AND NOT ON THE PLAN.
 2. ALL SHADING MUST BE DONE NEATLY ACCORDING TO THE INSTRUCTIONS IN THE QUESTIONS.
 3. ALL THE MAPS (ATTACHMENTS) MUST BE INSERTED INTO THE SCRIPT EVEN IF THE STUDENT DID NOT ATTEMPT THE QUESTION.
 4. STUDENTS MUST ENSURE THAT THEIR STUDENT NUMBER IS WRITTEN ON ALL THE MAPS.
 5. CALCULATORS ARE PERMITTED (ONLY ONE PER STUDENT)
 6. STUDENTS TO SUPPLY DRAWING INSTRUMENTS.
 7. GRAPH PAPER IS REQUIRED – 2 SHEETS PER STUDENT
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INSTRUCTIONS TO CANDIDATES:

PLEASE ANSWER ALL THE QUESTIONS.

Question 1:

The scale of the plan is 1 : 2500.

The plan shows surface contours at 30 m intervals. Prospecting has been done to establish the extent of a orebody.

It is proposed to mine the reef by opencast methods with a maximum overburden thickness of 45 m.

Given (prospecting information):

Point	Reef	Fault
A	"Outcrop"	-----
B	"Outcrop"	-----
C	"Outcrop"	-----
D	-----	"Outcrop"
E	-----	"Outcrop"
F	"Outcrop"	-----
G	-----	"Outcrop"

- 1.1 Graphically plot the outcrop of the fault on the plan. (5)
- 1.2 Graphically plot the outcrop of the reef on the plan. (8)
- 1.3 Determine the true dip, the direction of true dip and the strike of the fault. (5)
- 1.4 Determine the true dip, the direction of true dip and the strike of the reef. (5)
- 1.5 Draw the lines of intersection. (2)
- 1.6 Shade the area on the map where the reef can be mined by opencast methods with a maximum overburden of 45 m.
DO NOT SHADE ANY OTHER AREAS . (7)
- 1.7 Determine the vertical throw of the fault. Classify the fault (normal or reverse).
Give an explanation of the fault classification. (4)
- 1.8 Draw a section on line J-K in your exam books (script).
Use a vertical scale of 1:1500 and a horizontal scale the same as the plan. (10)
- 1.9 Determine the dip of the fault in the section J-K and explain why this dip may be different to the answer given in 1.3. (4)

[50]

QUESTION 2

The map shows an area of ground where a Thin Coal Seam is to be mined. A major fault is expected through the area and exploration and prospecting was done from surface to investigate the nature and position of this fault in relation to the coal.

The plan shows the surface contours at 30 metre intervals.

The scale is shown on the plan (1 : 1500).

Drilling results are shown in the table below :

Point	Depth of reef intersection below collar	Depth of fault intersection below collar
H	“Outcrop”	90 m
J	-----	“Outcrop”
K	-----	“Outcrop”
L	“Outcrop”	-----
M	“Outcrop”	-----
N	150 m	-----

Answer the following questions:

- 2.1 Graphically plot the outcrop of the fault on the plan. (4)
- 2.2 Graphically plot the outcrop of the thin coal seam on the plan. (8)
- 2.3 Determine the true dip, the direction of true dip and the strike of the fault. (4)
- 2.4 Determine the true dip, the direction of true dip and the strike of the coal. (4)
- 2.5 Draw the coal / fault lines of intersection. (4)
- 2.6 Shade the area on the map where the coal does exist (the area underlain by coal).
DO NOT SHADE ANY OTHER AREAS – this shading must be neat and cover the entire area underlain by coal. (8)
- 2.7 Determine the vertical throw of the fault. Classify the fault (normal or reverse). (8)
- 2.8 Draw a section on line R-S in your exam books (script).
 Use a vertical scale of 1:1500 and a horizontal scale the same as the plan. (10)
- [50]**

Total = 100 marks

Time allocation – 08:00 to 11:00

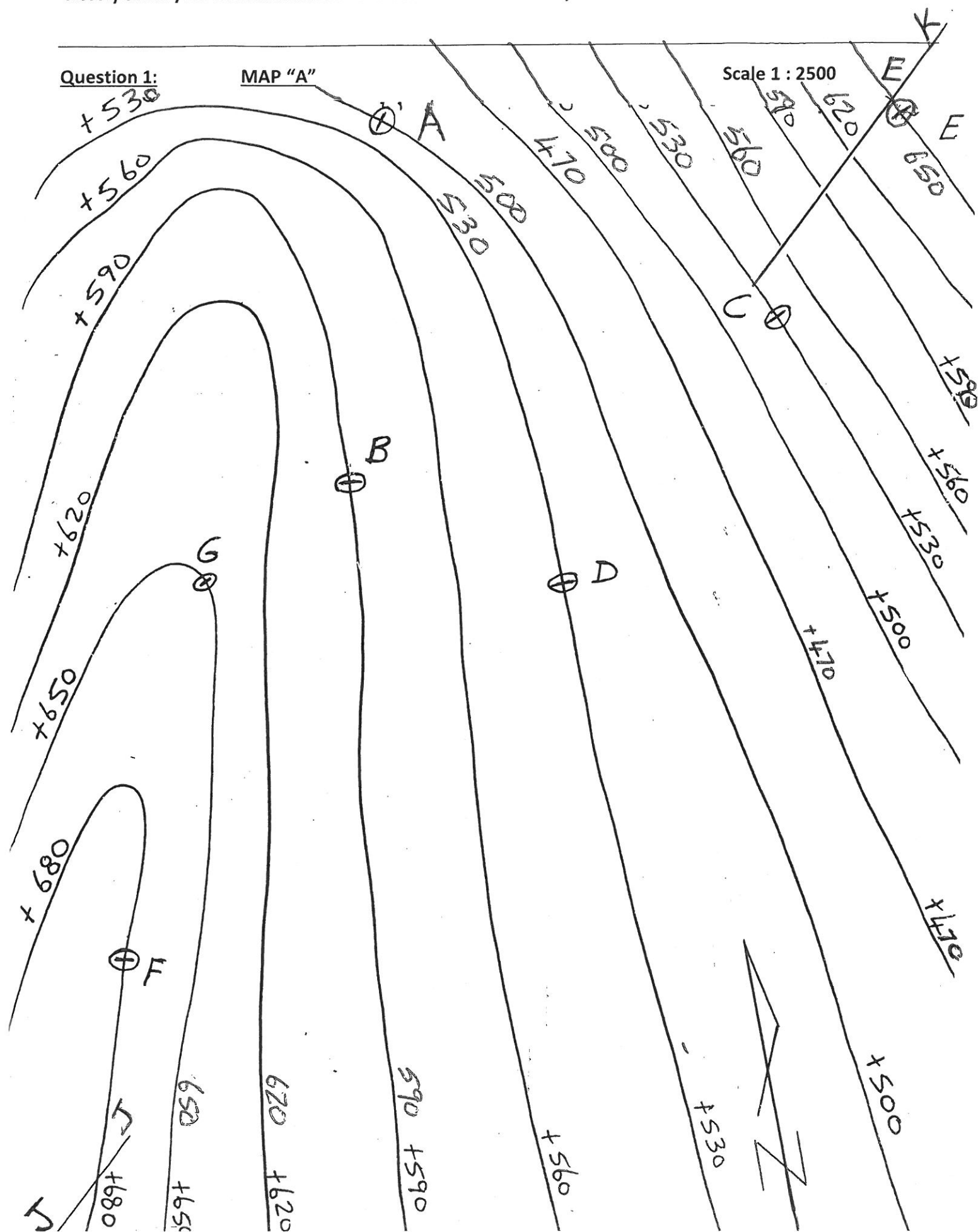
Student Surname:

Clearly show your student number and surname on each map. Student Number:

Question 1:

MAP "A"

Scale 1 : 2500



Time allocation – 08:00 to 11:00

Student Surname:

Clearly show your student number and surname on each map. Student Number:

