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UNIVERSITY OF NAMIBIA

FACULTY	Agriculture, Engineering and Natural Sciences		
DEPARTMENT	Geosciences		
SUBJECT	Sedimentology and Energy Resources		
SUBJECT CODE	S3711GY		
PAPER	PAPER 1 – Theory		
DATE	May/June 2026		
DURATION	**180 min (3 hours)**	**MARKS**	95

FIRST OPPORTUNITY EXAMINATION

Examiner: Dr. M. Harris and Prof. Tse

Internal Moderator: Dr. C. I. Uahengo

External Moderator: Prof Francis A. Macdonald

This question paper consists of four pages (including this one)

Instructions
Closed book examination
Answer all six (6) questions.
Recommendation: read first all subordinate questions before you answer.

UNIVERSITY OF NAMIBIA EXAMINATIONS

Question 1: **[15 marks]**

(a) Briefly describe the materials and facilities needed for grain size sieve analysis. (5)

(b) Discuss the necessary graphs/ diagrams which can be used to display grain sieve analysis data. Furthermore, state the statistical parameters which are applied to sieve analysis. (10)

Question 2: **[10 marks]**

(a) Name and sketch two sedimentary structures which can be used to infer current direction in sedimentary rocks. (5)

(b) Name and Sketch two sedimentary structures which can be used to infer the younging direction/wayup in sedimentary rocks. (5)

Question 3: **[10 marks]**

Describe the characteristics of Beach deposits. (10)

Question 4: **[10 marks]**

In terms of morphology and processes, discuss the difference between alluvial fans and submarine fans. (10)

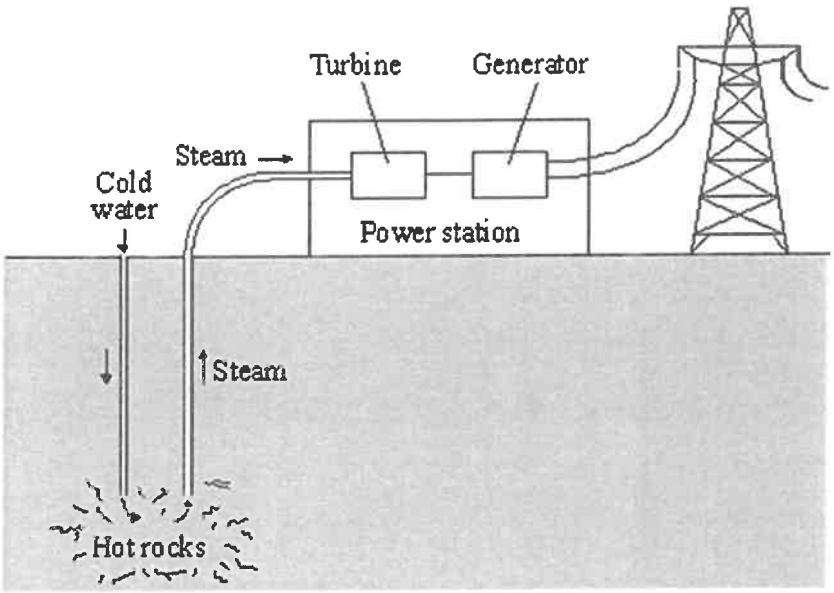
Question 5 **[25 marks]**

The Namibian Renewable Energy Division of the Ministry of Industries, Mines and Energy is tasked with the implementation of Renewable Energy and Energy Efficiency programmes. During a recent field trip, your team encountered the 60oC hot spring in Ais Ais. The Director of the Division has tasked you to lead an investigation into the potential of the spring as a geothermal energy source.

5.1 Briefly show how you will carry out a geological investigation to assess the viability of the geothermal resource. (8 marks)

5.2 Outline a bankable feasibility report to obtain funding for the implementation of the project. (5 marks)

5.3 The diagram shows a geothermal power station. Explain how a geothermal power station generates electricity. (5 marks)



5.4 Scientists have estimated that one quarter of the world's electricity could be generated using geothermal energy. Give 3 reasons that scientists might use to persuade a government to spend large amounts of money building geothermal power stations. (3 marks)

5.5 Briefly explain the origin of hot springs (5 marks)

Question 6 **[25 marks]**

Green hydrogen projects, which use renewable energy for water electrolysis, offer a zero-emission, versatile fuel source key to decarbonizing heavy industries and transportation. Key advantages include high energy density, storable energy, and sustainability. However, major challenges include high production costs, low efficiency,, and significant infrastructure needs.

6.1 Explain how green hydrogen is obtained from sea water. (5 marks)

6.2 Explain the mechanism of serpentinization and production of native hydrogen. (5 marks)

6.3 Briefly discuss the relationship of serpentinization, hydrogen and fairy circles which also occur in Namibia. (5 marks)

6.4 Enumerate 4 advantages of Green Hydrogen Projects. (5 marks)

6.5. Enumerate 5 disadvantages/Challenges of green hydrogen projects. (5 marks)

END OF EXAMINATION