



‘সমানো মন্ত্র: সমিতি: সমানী’

UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 5th Semester Examination, 2023

DSE-P2-GEOLOGY

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

**The question paper contains DSE-2A and DSE-2B.
The candidates are required to answer any *one* from *two* parts.
Candidates should mention it clearly on the Answer Book.**

DSE-2A

FUEL GEOLOGY

1. Answer any **five** questions: 1×5 = 5
 - (a) What are the sources of organic materials in petroleum?
 - (b) What are the key properties used to characterize petroleum and natural gas?
 - (c) What is the chemical composition of Crude oil?
 - (d) What is coal tar? What are its uses?
 - (e) How is humic coal different from sapropelic coal?
 - (f) How you will differentiate between Vitrinite and Liptinite under microscope?
 - (g) What is the primary aim of coal liquefaction process?
 - (h) What geologic structures usually form the largest petroleum traps?

2. Answer any **three** questions: 5×3 = 15
 - (a) What are the geologic conditions necessary for formation Coal?
 - (b) State harmful effects of using fossil fuels.
 - (c) Is natural gas more “natural” than other fossil fuels?
 - (d) On what factors does the specific gravity of coal depend?
 - (e) Compare Direct and Indirect Liquefaction process.

3. Answer any **two** questions: 10×2 = 20
 - (a) What is Microlithotype? Write about different Microlithotypes of Coal. How will you infer about the depositional environments of a coal sample after seeing Microlithotype types of that sample coal? 2+3+5
 - (b) Contrast the geologic conditions responsible for the formation of coal and crude oil. 5+5

- (c) How does the cost of UCG syngas compare with natural gas, CBM, oil or coal? $2\frac{1}{2} \times 4 = 10$
- (d) What are the factors that strongly affect the formation of Gas Hydrate? Among the Underground Coal Gasification (UCG) and Surface Coal Gasification (SCG), which one is the more preferred Coal Gasification technique and why? $5+5$

DSE-2B

RIVER SCIENCE

1. Answer any *five* of the following: $1 \times 5 = 5$
- (a) Define perennial river.
 - (b) What is Reynolds number?
 - (c) What do you mean by Riffle?
 - (d) What is a crevasse splay? When does it form?
 - (e) What is a laminar flow?
 - (f) What does “UH” mean in hydrograph?
 - (g) Draw a sketch and show different parts of a river terrace.
 - (h) What is an Antecedent stream?
2. Answer any *three* of the following: $5 \times 3 = 15$
- (a) Describe with neat sketch how an ox-bow-lake is formed.
 - (b) Discuss Horton-Strahler stream order scheme using diagram.
 - (c) Add a short note on karst topography.
 - (d) Describe different modes of sediment transport through a channel.
 - (e) Classify river channel morphology based on flow depth and grain size index.
3. Answer any *two* of the following: $10 \times 2 = 20$
- (a) Describe different factors affecting hydrological response of a basin.
 - (b) Discuss and illustrate geomorphic transitions along a rivers longitudinal profile.
 - (c) What are the different types of drainage network observed in nature? Describe with sketches.
 - (d) What is Bernoulli’s theorem? Show how Bernoulli’s equation can be derive maintaining the principle of conservation of energy.

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