



‘সমানো মন্ত্র: সমিতি: সমানী’

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 5th Semester Examination, 2022

DSE-P2-GEOLOGY

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

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

PART-A

FUEL GEOLOGY

1. Answer any **five** questions: 1×5 = 5
 - (a) Increasing H/C ratio is a must in case of Coal Liquefaction. How is it possible?
 - (b) Why gas hydrate is so important?
 - (c) Why *Domiasiat* is important?
 - (d) What are macerals?
 - (e) How is humic coal differ from sapropelic coal?
 - (f) Hydrogen available for combustion is lesser than the actual one — True or False.
 - (g) When the crude oil is referred to be ‘sweet’?
 - (h) Why gas hydrate is also known as fire ice?

2. Answer any **three** questions: 5×3 = 15
 - (a) Write briefly about nuclear wastes disposal.
 - (b) Describe about the characters of reservoir rocks of Oil and Gas.
 - (c) What is/are the nature of energy involved in the transformation / maturation of organic matter?
 - (d) Write down about the major applications of Underground Coal Gasification (UCG).
 - (e) How cementation and dolomitization controls the effectiveness of a stratigraphic traps?
 - (f) “*Volatile matter is a desired component of coal*” — Discuss the statement.

3. Answer any **two** questions: 10×2 = 20
 - (a) What are the advantages of UCG over Coal Bed Methane (CBM)? Write down about the benefits of use of nuclear fuel over use of coal. 5+5
 - (b) How does oil accumulate in nature? 10

- (c) Why CBM is considered as unconventional gas? Write down about the importance of cleats in CBM production. What are the controlling factors of CBM production? 2+4+4
- (d) What is hydrocarbon migration? Explain primary migration of hydrocarbon in the light of *Shale Compaction Curves*. 2+8

PART-B

RIVER SCIENCE

1. Answer any *five* of the following: 1×5 = 5
- (a) What do you mean by Natural levee?
 - (b) What is a point-bar?
 - (c) Draw a sketch of an ox-bow lake.
 - (d) What is an antecedent river?
 - (e) Mention a similarity and a difference between alluvial fan and delta.
 - (f) What type of sediment load is deposited first when a river enters the ocean?
 - (g) What are the types of drainage pattern that tend to develop around a volcano?
 - (h) Name two rivers from Indian sub-continent that flows toward west.
2. Answer any *three* of the following: 5×3 = 15
- (a) What are the modes of sediment transportation in river systems?
 - (b) What do you understand by 'Bed Shear Stress' and 'Stream Power'? Give mathematical expression.
 - (c) What do you understand by boundary layer? Draw suitable diagram.
 - (d) How river flow can be idealized based on velocity and acceleration of flow?
 - (e) List the fundamental factors that influence drainage basin morphology.
3. Answer any *two* of the following: 10×2 = 20
- (a) Give a synoptic view of the principal factors controlling water erosion of hill slope and sediment yield to river channels.
 - (b) Illustrate and describe the possible hydrological pathways in a drainage basin.
 - (c) Comment on the Rosgen's classification of natural river.
 - (d) What do you understand by 'stream order'? Describe the different schemes of ordering streams.

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