

This question paper contains 3 printed pages]

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S. No. of Question Paper : 1749

Unique Paper Code : 2192013602

Name of the Paper : Fuel Geology

Name of the Course : B.Sc. (Hons.) Geology, NEP-UGCF

Semester : VI (DSC-17)

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer any five questions in all and
attempt a minimum of two questions from each Section.

All questions carry equal marks.

Section A : Petroleum Geology

1. Answer the following in brief :

- (a) What is the geological age of Cambay basin H/C reservoir rocks ?
- (b) What is spill point ?
- (c) What is the API value of crude oil ?
- (d) What is effective porosity ?
- (e) What is the temperature range of an oil window ?
- (f) How does time play a role in hydrocarbon generation ?

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- (g) What is the range of specific gravity of hydrocarbons ?
 - (h) Write the name of an oil field where the source rock is also acting as a reservoir rock.
 - (i) How does buoyancy develop in a reservoir rock ?
2. (a) Discuss the criteria for a rock to be classified as a source rock for hydrocarbons.
- (b) Discuss the role of oxic and anoxic environments in deposition of hydrocarbon source rocks.
- (c) Explain the stagnant model of organic material deposition, with suitable examples.
3. Write short notes on any *three* of the following :
- (a) Development of the non-clastic reservoir rocks with Indian examples.
 - (b) Effect of temperature on the porosity and permeability of reservoir rocks.
 - (c) Geological settings of Cambay Basin and its hydrocarbon potential.
 - (d) Role of plate tectonics in the distribution of hydrocarbon reservoirs.
4. Discuss in detail any *two* of the following :
- (a) Types of Kerogen and their role in hydrocarbon generation with Van Krevelen diagram.
 - (b) How does hydrodynamic flow, coupled with buoyancy, affect the migration of hydrocarbons in a reservoir rock ?
 - (c) Abiotic origin of hydrocarbons and its limitations.

Section B : Coal Geology

5. Write short notes on any *three* of the following :
 - (a) Macrolithotypes of hard coal and their application in coal utilization
 - (b) Principle of underground coal gasification and also comment upon its advantages and disadvantages
 - (c) Proximate analysis of coal
 - (d) Rank, grade and types of coal.
6. Define classifying criterion for maceral groups, and also enumerate the diagnostic properties of each maceral groups. Explain Liptinite group of macerals in detail and comment on the importance of fluorescence microscopy in maceral study.
7. Explain the methods of direct and indirect coal liquefaction and enumerate their merits and demerits. Comment on the status of present scenario of coal liquefaction in India and its need to secure energy security of India.
8. Discuss coal bed methane (CBM) in terms of their geological settings, production, environmental hazards and its prospect in India. Discuss parameters of a coal seam to be suitable for CBM accumulation. Enlist the major differences between coal bed methane (CBM) and conventional gas reserves.

