

MASTER OF SCIENCE EXAMINATION, 2017

(2nd Year, 1st Semester)

APPLIED GEOLOGY

Paper : X

Fuel Geology

Time : Two hours

Full Marks : 50

Use separate Answer scripts for each group.

GROUP - A (25 marks)

(Petroleum Geology)

1. State whether the following statements are true or false. Justify with proper reasoning. (any **five**) 5x3=15
 - (a) Van Krevelen diagram used to identify different kerogens based on H:C and O:C proportions.
 - (b) The generation of hydrocarbon requires anoxic condition.
 - (c) Resistivity logs show low resistivity in graphite bearing formation.
 - (d) Open Hole Logs measure the properties of producing fluids in the production phase.
 - (e) Density-Neutron logs can be used to detect gas within the formation.

(Turn Over)

(2)

- (f) Secondary migration of hydrocarbon occurs by diffusion processes.
2. Draw a schematic diagram that illustrates an idealized version of borehole (when fluids from the borehole invade the surrounding rock). $1 \times 5 = 5$
3. Write short notes (any **two**) $2 \times 2.5 = 5$
- (a) Evidence of Migration
 - (b) Rock Eval Pyrolysis
 - (c) Primary Stratigraphic Traps

GROUP - B (25 marks)
(Coal Geology)

4. (a) During process of thermo-chemical coalification, what are the changes (both physical and chemical) that take place from soft brown coal to low volatile bituminous rank? Between which ranks, oil window effectively occurs? Explain with appropriate diagrams. $5 + 2 + 3 = 10$

OR

(3)

- (b) What are the microscopic constituents of coal? How are these distinguished under oil immersion method? How do maturity of coal identified with the help of these constituents? $2 + 4 + 4 = 10$
5. (a) Distinguish between coking and non-coking coals by their chemical and special properties. What is ash fusion temperature? Why determination of this temperature is important for coking coals? Discuss why 'Fluidized Bed Combustion' is more effective in thermal power generation compared to 'Stacked Combustion'. $2 + 2 + 2 + 4 = 10$

OR

- (b) Discuss the techniques of production of crude petroleum from coal. How are coal selected for this transformations? $7 + 3 = 10$
6. Write short notes on (any **two**): $2.5 \times 2 = 5$
- (a) Peat forming set up in a basin.
 - (b) Pollution from open cast mining activity.
 - (c) Crucible swelling Index (CSI).

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