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3 (Sem-6/CBCS) GLG HE 1

2024

GEOLOGY

(Honours Elective)

Paper : GLG-HE-6016

(Fuel Geology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct option : $1 \times 7 = 7$

(a) Cannel coal is a type of

(i) Sapropelic coal

(ii) Humic coal

(iii) Boghead coal

(iv) Both (i) and (ii)

(b) Which of the following is known as brown coal ?

(i) Peat

(ii) Lignite

Contd.

- (iii) Bituminous
 - (iv) Anthracite
- (c) Which of the following belongs to vitrinite maceral group ?
- (i) Tellinite
 - (ii) Collinite
 - (iii) Sporinite
 - (iv) Both (i) and (ii)
- (d) Paraffins are also known as
- (i) Alkene
 - (ii) Alkyne
 - (iii) Alkane
 - (iv) Arene
- (e) During the formation of different types of hydrocarbons in different temperatures/depth zones bacteriogenic methane and a lesser amount of heavy crude oil are produced in which of the following stages ?
- (i) Diagenesis
 - (ii) Catagenesis
 - (iii) Metagenesis
 - (iv) Both (i) and (ii)

- (f) Which of the following is a petroleum product ?
- (i) Naphthalene
 - (ii) Polyurethane
 - (iii) Bitumen
 - (iv) All of the above
- (g) The causes for the migration of petroleum are
- (i) Compaction of the source rock
 - (ii) Buoyancy effect
 - (iii) Capillary effect
 - (iv) All of the above
2. Answer the following questions : $2 \times 4 = 8$
- (a) What is ultimate analysis of coal ?
 - (b) What do you understand by oil window ?
 - (c) What is CBM ?
 - (d) How is density of oil expressed by the API ?
3. Write the following : **(any three)** $5 \times 3 = 15$
- (a) Coal liquefaction
 - (b) Maturation of kerogen
 - (c) Classification of reservoir rocks
 - (d) Origin of petroleum
 - (e) Microlithotypes

4. Answer the following questions : (**any three**)

10×3=30

(a) Write on the mode of origin of coal. Describe briefly about the distribution of coal in North-East India. 6+4=10

(b) Discuss in detail on classification of coal. Add a note on underground coal gasification. 5+5=10

(c) Define source rock, reservoir rock and cap rock. Discuss in detail about the petrophysical properties of reservoir rock. 3+7=10

(d) Write briefly on chemical composition and physical properties of crudes in nature. Add a note on plate tectonics and global distribution of hydrocarbon reserves. 4+6=10

(e) Discuss about the different types of trap rocks. Add a note on the distribution of oil within a trap. 7+3=10

(f) Write notes on the following : 5+5=10

(i) Nuclear fuel

(ii) Gas hydrate