

2019

GEOLOGY

( Major )

Paper : 6.4

( Fuel Geology and Mining Geology )

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks  
for the questions

1. Choose the correct option :

1×7=7

(a) Which of the following is a dry gas?

(i) Methane

(ii) Ethane

(iii) Propane

(iv) Butane

(b) Paraffins, often called as \_\_\_\_\_, are saturated hydrocarbons.

(i) alkene

(ii) alkyne

(iii) alkane

(iv) arene



(c) Which one of the following is an important attribute of a permeable reservoir?

- (i) Abrupt fluid contact
- (ii) Gradational fluid contact
- (iii) Very fine texture
- (iv) Absence of tarmats

(d) Which of the following terms is not related to evolution of organic matter in response to burial?

- (i) Catagenesis
- (ii) Diagenesis
- (iii) Metagenesis
- (iv) Telogenesis

(e) Find the odd one out :

- (i) Cutinite
- (ii) Micrinite
- (iii) Resinite
- (iv) Fusinite

(f) Which of the following is not true?

- (i) Alpha particles have lower velocity, smaller penetrating power than beta radiations and are influenced by magnetic field.
- (ii) Beta radiations are slower than alpha radiations and are not influenced by magnetic field.

(iii) Gamma rays have the greatest penetrating power with the velocity as that of light.

(iv) Half-life of an element is the time required for radioactive decay of one half of its mass.

(g) Find the odd one out :

- (i) Pyrheliometer
- (ii) Pyranometer
- (iii) Sphygmomanometer
- (iv) Sunshine recorder

2. Write very briefly on the following :  $2 \times 4 = 8$

- (a) API gravity
- (b) Coal rank
- (c) Gophering
- (d) Stope

3. Write short notes on any three of the following :  $5 \times 3 = 15$

- (a) Reservoir rocks
- (b) Uranium minerals and types of uranium deposits in India
- (c) Wave energy
- (d) Underground mine ventilation

4. What is wind power? How many types of wind machines are there and how do they work? Add a note on the wind energy programme of India.  $3 + 5 + 2 = 10$



Or

Write about the distribution of coal in India. How does tertiary coal of North-East India differ from the Permo-Carboniferous coals of peninsular India? What is coal bed methane?

$$7+1\frac{1}{2}+1\frac{1}{2}=10$$

5. Define source rocks. Discuss the phenomenon of petroleum migration. What is petroleum system?

$$2+6+2=10$$

Or

Discuss about the different types of trap rocks. Add a note on the distribution of oil within a trap.

$$7+3=10$$

6. Write about the different extraction techniques or mining techniques operational in open-cast mining. Add a brief note on the environmental hazards generated due to open-cast mining.

$$6+4=10$$

Or

Write short notes on any two of the following :

$$5 \times 2 = 10$$

- (a) Underground mining
- (b) Sampling techniques
- (c) Bord-and-Pillar method of mining