

DIPLOMA WALLAH

JHARKHAND UNIVERSITY OF TECHNOLOGY (JUT)

Diploma in Mining Engineering | Subject: Mining Geology - II

SAMPLE PAPER - 1

Instructions :

- **Full Marks:** 70 | **Time:** 3 Hours
- Question No. 1 is **compulsory** (7 MCQs x 2 Marks = 14 Marks).
- Answer any **FOUR** questions from the remaining (Q.2 to Q.7). Each carries 14 marks.
- Illustrate your answers with neat sketches/diagrams wherever necessary.

Q.1 Choose the correct option for the following:

[7 × 2 = 14]

i. An upward arching fold where older rocks are found at the core is called an:

- (a) Syncline (b) Anticline
(c) Monocline (d) Isocline

ii. A type of fault in which the hanging wall moves downwards relative to the footwall is known as:

- (a) Normal Fault (b) Reverse Fault
(c) Strike-slip Fault (d) Thrust Fault

iii. The Gondwana Supergroup of rocks in India is economically most famous for the deposits of:

- (a) Iron Ore (b) Copper
(c) Coal (d) Bauxite

iv. The useless, non-valuable minerals associated with an ore are called:

- (a) Tenor (b) Gangue
(c) Grade (d) Matrix

v. Bauxite is the principal ore of which of the following metals?

- (a) Iron (b) Copper
(c) Aluminum (d) Zinc

vi. The boundary or surface of separation between two distinct sequences of rocks, representing a gap in the geological record, is termed as:

- (a) Fault plane (b) Unconformity
(c) Joint (d) Bedding plane

vii. Which geological time scale era is also known as the "Age of Reptiles"?

- (a) Paleozoic (b) Mesozoic
(c) Cenozoic (d) Precambrian

Q.2 (A) Define the term "Fold" in structural geology. Explain the various parts of a fold with the help of a neat, labeled sketch. [7]

Q.2 (B) Classify folds based on their geometrical shape and orientation. Explain Anticline and Syncline in detail. [7]

Q.3 (A) What is a Fault? Differentiate between a Normal Fault and a Reverse Fault with suitable diagrams. What forces are responsible for their formation? [7]

Q.3 (B) Explain the term "Unconformity". Describe the different types of unconformities found in sedimentary rock formations. [7]

Q.4 (A) What do you understand by the "Geological Time Scale"? Briefly explain the major eras and periods into which earth's history is divided. [7]

Q.4 (B) Write a detailed note on the "Gondwana System" of Indian stratigraphy. Discuss its geological age, lithology, and immense economic importance. [7]

Q.5 (A) Define the following terms related to Economic Geology: [7]
(i) Ore, (ii) Gangue, (iii) Tenor of ore, (iv) Mineral deposit.

Q.5 (B) Explain the process of formation of mineral deposits by "Magmatic Concentration" and "Hydrothermal Processes". [7]

Q.6 (A) Discuss the origin, physical properties, and geological distribution of Coal deposits in India, with special reference to Jharkhand. [7]

Q.6 (B) Name the important ores of Iron and Copper. Give a brief account of the geographical distribution of Iron ore in India. [7]

Q.7 Write short notes on any FOUR of the following: [4 × 3.5 = 14]

- A. Joints and their significance in mining
- B. Dharwar System of rocks
- C. Placer deposits

D. Strike and Dip of a rock bed

E. Uses and distribution of Mica in Jharkhand

PAPER 1 - ANSWER KEY & MODEL HINTS

Q1 (MCQ Answers): i-(b), ii-(a), iii-(c), iv-(b), v-(c), vi-(b), vii-(b)

Model Hints for Theory:

Q2 Folds: Wavelike undulations in rock strata caused by compressive tectonic forces. *Parts:* Limbs, Hinge, Axial plane, Crest, Trough. *Anticline:* Convex upwards, older rocks in the core. *Syncline:* Concave upwards (bowl shape), younger rocks in the core.

Q3 Faults: Fractures in the earth's crust along which displacement has occurred. *Normal Fault:* Caused by tensional forces; hanging wall moves down. *Reverse Fault:* Caused by compressional forces; hanging wall moves up relative to the footwall.

Q4 Gondwana System: Spans from Upper Carboniferous to Jurassic periods. Consists mostly of sandstones, shales, and coal seams. Economically, it is the most vital system for India as it contains 98% of the country's coal reserves (Jharia, Raniganj, Bokaro, Karanpura).

Q5 Economic Geology Terms: *Ore:* A mineral from which a metal can be extracted profitably. *Gangue:* The worthless earthy/rocky impurities. *Tenor:* The percentage of metal content present in the ore. *Hydrothermal deposits:* Formed by precipitation of minerals from hot, aqueous, mineral-rich fluids escaping from cooling magma.

Q6 Coal & Iron: *Coal in Jharkhand:* Jharia (Prime coking coal), Bokaro, Karanpura. *Iron Ores:* Hematite and Magnetite. Major distribution in Singhbhum (Jharkhand), Keonjhar (Odisha), Bailadila (Chhattisgarh).

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