B. Sc. Geological Sciences Examination, 2024

(3rd Year, 2nd Semester, Special Supplementary)

Exploration Geology

Paper – CORE/TH/04A

Time : Two hours Full Marks : 40

(Use a separate Answer script for each Part)

PART – I (20 Marks)

Answer any ***four*** questions. 4×5=20

1. a) What is gossan? Why is it important in exploration geology?

   b) With an example explain the role of weathering in the formation of mineral deposits. 3+2=5

2. a) Describe the mode of occurrence of major ore deposits in the Singhbhum region.

   b) What are the main objectives of district scale mapping in mineral exploration? 3+2=5

3. a) Using a diagram show the disposition of structural traps for petroleum occurrence above a salt dome.

   b) Explain the mechanisms of petroleum reservoir formation in association with imbricate thrusts. 2+3=5

4. a) Describe the structural control on the formation of major Gondwana coal basins in India.

b) How would you explain the occurrence of a petroleum reservoir in the hanging wall of a normal fault? 2+3=5

5. a) Write a short note on the principle of remote sensing techniques in exploration geology.

b) A terrain is covered by soils with heterogeneous iron contents. How can the regions of low- and high-iron contents be identified with the help of a remote sensing technique? 2+3=5

6. a) With the help of a diagram discuss the spectrum of reistivity variations of important geological materials.

b) Derive an equation to show that the gravity anomaly due to a spherical body is proportional to R^3, where R is the radius of the body. 3+2=5

PART – II (20 Marks)

Write in detail with the appropriate diagram (any ***two***): 2×10=20

1. Petrology and geochemistry of kimberlite and origin of diamond.
2. Use of Cr-diopside in Diamond Exploration.
3. Use of combined lithophile and chalcophile element geochemistry in Ni-Cu-PGE exploration.

4. Large Igneous Province (LIP) and orthomagmatic ore deposits.
5. Geochemical associations of elements and most widely used pathfinders in mineral exploration.