21I802 (Pages: 2) Name: .....

Reg.No: .....

EIGHTH SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, APRIL 2025

(CBCSS)

(Regular/Supplementary/Improvement)

CC20 GLO8 IB17 - EXPLORATION GEOPHYSICS AND FIELD TECHNIQUES

(Geology)

(2020 Admission onwards)

Time : Three Hours Maximum : 80 Marks

Credit: 4

Section A

Answer any ***ten*** question. Each question carries 2 marks.

1. Explain Sink and source.
2. How can a three-layer resistivity survey help in distinguishing between H-type, K-type, A-type, and Q-type curves?
3. Describe the characteristics of an HAK-type resistivity curve.
4. How can SP data help in identifying ore bodies, give me an example?
5. What is Bouguer correction, and what does it account for?
6. Curie Temperature.
7. Magnetic elevation and terrain correction.
8. Seismic Discontinuities.
9. Wavefront Reflection.
10. Resolution in wll logging.
11. Density log.
12. Warp around in log presentation.

(10 × 2 = 20 Marks)

Section B

Answer any ***five*** question. Each question carries 8 marks.

13. Consider the pole-dipole configuration, in which the distance between the potential electrodes(MN) is 10m and the distance between the N and to the current elctrode A is 50m. Find the Geometrical factor for the configuration?
14. Discuss the relationship between rock density and gravity anomalies. How do different rock types influence gravity measurements? Provide examples.

15. For an ore body like Chromite having a density contrast of 1.5gm/cc, in the form of infinitly long horizontal cyclinder with a radius of 100 ft, buried at a depth of 160ft to the center of the cylinder.Find the maximun gravity anomaly?

16. Describe how dipping reflectors appear on a seismic section. What challenges do they present in data interpretation?

17. For a two-layer earth model, the velocity of p-waves through the upper layer is 3 km/s and through the bottom layer is 3.2 km/s. If the depth of the reflector is 1 km, the cross-over distance is _____ km.

18. Describe dead time correction in spectrometers? Explain its importance in ensuring accurate data collection in radiation surveys.

19. Discuss how radiometric data can be used to map lithological boundaries.

(5 × 8 = 40 Marks)

Section C

Answer any ***two*** question. Each question carries 10 marks.

20. Explain the relationship between geological structures and geophysical properties of the Earth, and how geophysics helps in understanding subsurface formations.

21. Discuss airborne geophysical surveys. Describe their advantages and limitations compared to ground-based magnetic surveys.

22. How do Snell's law and Huygens' principle together describe seismic wave propagation across layered Earth? Explain their role in understanding wave behavior and subsurface interpretation.

23. For the data given below: Resistivity of Flushed zone = 1.30 Ωm Resistivity of mud filtrate = 0.65 Ωm Residual oil saturation = 25% Saturation exponent = 2 Find the formation factor.

(2 × 10 = 20 Marks)

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