

MRT 351-2 Geophysics

Number of questions: Part A – Twelve (12) Structured, Part B – Two (02) Essay

Answer all questions

Time allocation: Two (02) hours

Marks allocation: 100

Index No.

Part A

1. Distinguish between active and passive geophysical techniques. Give an example for each.

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2. State the physical property detected by each geophysical technique.

- (a) Seismic
- (b) Gravity
- (c) Resistivity
- (d) Magnetic
- (e) Electromagnetic.....

3. Giving an example, explain geophysical anomaly.

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4. Briefly describe the two methods of line configuration in a geophysical survey.

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5. How does the station interval of a geophysical survey affect the quality of its output?

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6. Distinguish between global geophysics and applied geophysics.

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7. Explain the condition where a refracted seismic wave from a seismic source can reach a detector before the direct wave.

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8. Briefly describe the nature of particle motion in a Rayleigh wave.

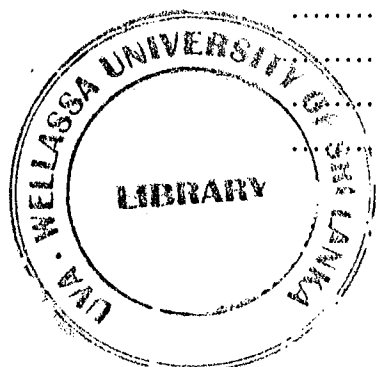
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9. Why don't S-waves propagate through fluids?

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10. State two (02) essential characteristics of a seismic source.

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11. List the components of a moving-coil geophone.

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12. Briefly describe the functions of the transmitter and the receiver in electromagnetic surveys.

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(5 x 12 = 60 marks)

Part B

1. (a) Discuss the nature of electrical current flow in the subsurface.
- (b) Describe the characteristics of the Wenner electrode array.
- (c) Qualitatively interpret H-type and K-type resistivity curves obtained from vertical electrical sounding.
- (d) Describe the application of constant separation traversing and vertical electrical sounding for subsurface investigation.

(20 marks)

2. (a) Describe ferromagnetism of earth materials and its importance in metallic mineral prospecting.
- (b) Discuss secular variation and diurnal variation of earth's magnetic field.
- (c) Explain the principle of a proton precession magnetometer.
- (d) With a suitable example, give a qualitative interpretation of a magnetic anomaly.

(20 marks)

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